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THE HISTORICAL BACKGROUND OF MEDIEVAL INTELLECTUAL INTERESTS

A STUDY IN PAGANISM, CHRISTIANITY AND THE DECLINE OF ANCIENT SCIENCE[1]

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I. Introductory

In an earlier paper on the relation between history and the history of science,[2] I endeavored to show that the historian could be most helpful to the scientist interested in the history of science through inculcating the canons of historical research, in order to secure a more critical use of the sources of information, and by indicating the general cultural conditions of any epoch which have encouraged or retarded the growth of those attitudes of mind which are essential to the flourishing of any healthy scientific activity.

The acquisition of a knowledge of the technique of historical research is something which can come only from a long-standing and reverent contact with such works as those by Bernheim, Wolf, and Langlois and Seignobos, and cannot fall within the scope of such a paper as this. In illustrating the other phase of a possible fruitful relation between history and the history of science two periods of particular pertinence might be chosen. One is the era of the decline of ancient science, and the other that of the scientific revival of the seventeenth century. From considerations of both logic and chronology I have chosen the first of these periods as that upon which to base a brief analysis of the manner in

[1]Paper prepared for the Toronto Meeting of the American Association for the Advancement of Science, Section on the History of Science, December, 1921.

[2]"The Historian and the History of Science," in *Scientific Monthly*, August, 1920.

which a knowledge of cultural conditions and intellectual attitudes at large is helpful in understanding the status of, and the tendencies in, natural science. It will be my aim to point out the more important historical causes for the decline of the scientific interests and activities of the Hellenic world, and for the impossibility of the development of any creative scientific endeavor until the Patristic orientation had been eliminated with the gradual growth of a different outlook and attitude after the passage of more than a thousand years.[3]

II. Aspects of "Pagan" Culture in the Classical World which Obstructed the Development of Science

1. The Problem of the Decline of Ancient Science—Every student of intellectual history and the history of science is aware of the remarkable progress of the Greeks in the realm of natural science, including the brilliant origins with Thales and the Milesian group in the sixth and fifth centuries B. C.; the introduction of the atomic theory and a mechanistic theory of causation by Leucippus and Democritus; Aristotle's comprehensive work in scientific description and classification; the origins of medical science with Hippocrates; and, above all, the astonishing achievements of the scientists of the Hellenistic age—Euclid, Aristarchus, Eratosthenes, Archimedes, Hipparchus and Hero.[4]

Looking at this imposing advance from the crude beginnings of the Egyptians and the Babylonians, *purely from the standpoint of the development of science*, it is difficult to see why the process did not keep on after Hipparchus and Hero, develop applied science, and produce the modern scientific and industrial world two millenniums earlier than it actually was attained. The writer well recalls, in fact, that, as a student in one of the more noted courses on the history of science in this country, he listened to a confession on the part of the professor that scientists were at a loss to account for the decline of ancient science. The instructor placed his faith in a guess that it was because of the disintegration and disunity of Greek political life, but, as historians have made clear, Greek political conditions were more disturbed during the

[3]By all odds the best guide and bibliography for the field of this paper is to be found in Parts II-III of J. H. Robinson's "Outline of the History of the Western European Mind." The two most useful books, on the whole, are H. O. Taylor's "Classical Heritage of the Middle Ages" and "The Medieval Mind." I have endeavored to include as quotations some of the more notable passages from the better known books on the topics considered.

[4]Sedgwick and Tylor, "Short History of Science," Chaps. III-VI.

period of maximum scientific activity than during the age of its decline.

Yet, when the historian of culture views the classical and Patristic periods, the chief problem which confronts him is not why ancient science declined, but why it was able to persist as long as it did. He finds that nearly all phases of intellectual life, most of the prevailing attitudes of mind, and the social and economic conditions were either fundamentally opposed to the scientific frame of mind or were, in varying degrees, obstructive of the influences which would promote scientific activity. He feels the force of Professor Robinson's assertion that "there was no form of ignorance or of perversity of thought left for the Middle Ages to discover."

2. *The Weaknesses of Hellenic Science*—First, perhaps, might be mentioned the very nature of ancient science itself. Some of the more important weaknesses of ancient science were illustrated by Aristotle.[5] His penchant for finality and definiteness in classification and arrangement of data, clarifying as it was, savored of logic quite as much as of science. His sanctification of Empedocles' animistically derived notion of the four fundamental elements prevented the adoption of the sensible atomic theory of Democritus, and held physics and chemistry in bondage until the time of Paracelsus, Boyle and Stahl. His erroneous notions with respect to static and dynamic mechanics and his fantastic cosmology tended to obscure the accurate work done along this line by the Alexandrian and Hellenistic scientists, and, by its ascendency in scholastic thought, proved an obstruction to the growth of modern science as well. Then, his compiling tendency, valuable, perhaps, in his own hands and in those of Ptolemy, became, as early as Pliny, the vehicle for setting down as plausible vast masses of pseudo-scientific monstrosities, many of them accepted on the strength of tradition or gossip. The introduction of astrology not only brought many grotesque errors into every phase of thought, but specifically hindered the progress of astronomy.[6] The physiological chemistry, resting on the basis of the theory of the four humors, which constituted the "scientific" basis of the classical theory of pathology, not only was fatal to physiological chemistry, but also made difficult any definite progress in medical science, especially after this notion had been sanctified by Hippocrates and Galen, much as Aristotle had

[5]A. E. Taylor, "Aristotle"; and T. E. Lones, "Aristotle's Researches in Natural Science."

[6]A. Bouché-Leclercq, "L'Astrologie grecque"; F. Cumont, "Astrology and Religion among the Greeks and Romans."

perpetuated the allied notion of the four elements of Empedocles.[7]

Even the remarkable science of the Hellenistic period possessed its definite limitations. Archimedes and Hipparchus carried it about as far as it was possible with the existing modes of scientific endeavor and the technique for research. They had few or no instruments of precision, such as the microscope, balance, stop-watch and thermometer, a circumstance which prevented their inductive investigation from going beyond relatively superficial externals. An unwillingness to observe the commonplace, growing partly out of the Greek enthusiasm for the aesthetic and the transcendental, and partly out of the contempt for mundane matters through their association with servile labor, discouraged that observant attitude which is the beginning of all true scientific endeavor. A primary interest in absolutes and transcendentals, which was characteristic of the Greeks, led to a lack of concern with the changing and the dynamic aspects of the world of sense-phenomena, and prevented a general acceptance of the evolutionary concepts of Heracleitus and the Epicureans. Finally, there should be noted the Greek inability to make a practical application of the scientific knowledge they acquired. Though Hero, for example, had produced the turbine engine a hundred years before the Christian era, he could think of no more useful purpose to which to apply it than to furnish wondering amusement through opening temple doors. Though Archimedes produced many practical devices which might have been of the greatest industrial significance, especially his development of the principles of the lever and pulley, he did little more with them than to provide edification and amusement for King Hiero of Syracuse. Professor Robinson has admirably summarized these reasons why Greek science and thought were not adapted to producing indefinite progress and why they did not bring about the régime of applied science and industrialism during the period of the existence of the Hellenistic world:[8]

> After two or three hundred years of talking in the market place and of philosophic discussions prolonged until morning, such of the Greeks as were predisposed to speculation had thought all the thoughts and uttered all the criticisms of commonly accepted beliefs and of one another that could by any possibility occur to those who had little inclination to fare forth and extend their knowledge of the so-called realities of nature by painful and specialized research and examination. This is to me the chief reason why, except for some advances in mathematics, astronomy, geogra-

[7]F. H. Garrison, "Introduction to the History of Medicine," p. 59 ff.
[8]J. H. Robinson, "Mind in the Making," p. 111-3.

phy, and the refinements of scholarship, the glorious period of the Greek mind is commonly and rightfully assumed to have come to an end about the time of Aristotle's death. Why did the Greeks not go on, as modern scientists have gone on, with vistas of the unachieved still ahead of them?

In the first place, Greek civilization was founded on slavery and a fixed condition of the industrial arts. The philosopher and scholar was estopped from fumbling with those everyday processes that were associated with the mean life of the slave and servant. Consequently there was no one to devise the practical apparatus by which alone profound and ever-increasing knowledge of natural operations is possible. The mechanical inventiveness of the Greeks was slight, and hence they never came upon the lens; they had no microscope to reveal the minute, no telescope to attract the remote; they never devised a mechanical timepiece; a thermometer, nor a barometer, to say nothing of cameras and spectroscopes. Archimedes, it is reported, disdained to make any record of his ingenious devices, for they were unworthy of the noble profession of a philosopher. Such inventions as were made were usually either toys or of a heavy practical character. So the next great step forward in the extension of the human mind awaited the disappearance of slavery and the slowly dawning suspicion, and final repudiation, of the older metaphysics, which first became marked some three hundred years ago.

Roman science was, in the main, but an inferior imitation of Hellenic science. While the Romans certainly made notable contributions to the field of structural engineering, these rested much more on intuition and practical ingenuity than upon the understanding of the technical phases of the science of mechanics. They did little or nothing to advance the natural sciences, while, in the matter of the compilation of pseudo-science in such works as Pliny's "Natural History," they did much to degrade science and to block the operation of the strictly scientific impulses and procedure. Ancient science in itself thus furnished limitations upon its own development. Infinitely more important, however, in obstructing the growth of ancient science were the various non-scientific and anti-scientific currents of thought and attitudes of mind which dominated the classical world.

3. The Ascendency of Metaphysics in Hellenic Thought—Perhaps the most important aspect of classical intellectual and cultural conditions in obstructing the progress of scientific thought was the tendency towards metaphysical thought, which was a primary characteristic of Hellenic thinking. Professor Robinson thus comments upon this development in Greek thought:[9]

The second great discovery of the Greek thinkers was *metaphysics*. They did not have the name, which originated long after in quite an absurd fashion, but they reveled in the thing. Nowadays metaphysics is revered by some as our noblest effort to reach the highest truth, and scorned by others as the silliest of wild-goose chases. I am inclined to rate it, like smoking, as a highly gratifying indulgence to those who like it, and, as

[9]Robinson, *Ibid*, p. 102-3.

indulgences go, relatively innocent. The Greeks found that the mind could carry on an absorbing game with itself. We all engage in reveries and fantasies of a homely, everyday type, concerned with our desires or resentments, but the fantasy of the metaphysician busies itself with conceptions, abstractions, distinctions, hypotheses, postulates, and logical inferences. Having made certain postulates or hypotheses, he finds new conclusions, which he follows in a seemingly convincing manner. This gives him the delightful emotion of pursuing Truth, something as the simple man pursues a maiden. Only Truth is more elusive than the maiden and may continue to beckon her follower for many long years, no matter how gray and doddering he may become.

The significance of this type of thought in turning the Hellenic world aside from the observing mood and the concern with the concrete, essential to the scientist, can scarcely be overestimated. H. O. Taylor says: "The older Greek philosophies had sprung from open and unprejudiced observation of the visible world. They were physical inquiries. With Socrates philosophy turned, as it were, from fact to truth, to a consideration of the validity of human understanding. Thereupon the Greek mind became entranced with its own creations."[10] In a similar vein John Dewey writes: "There are, indeed, but two alternative courses. We must either find the appropriate objects and organs of knowledge in the mutual interactions of changing things; or else, to escape the infection of change, we *must* seek them in some transcendent and supernal region. The human mind deliberately, as it were, exhausted the logic of the changeless, the final, and the transcendent, before it essayed adventure on the pathless wastes of generation and transformation."[11] So obsessed were the great Greek minds with the lofty and desirable nature of abstract speculation that Aristotle's notion of God was that of a being eternally absorbed in contemplation and divine introspection.[12]

Beyond this general *Tendenz* towards enthusiasm for the metaphysically obtained "realities," which appeared at its best in the philosophy of Aristotle, the Stoics and the Epicureans, there were special variations and manifestations of this characteristic which were even more deadly to scientific thought. Perhaps the least offensive of these was the idealism of Plato. Turning with his master, Socrates, away from the Sophistic emphasis on the relativity of knowledge and the significance of the concrete and specific, he sought reality in transcendental types. Unable to endure the thought that

[10]H. O. Taylor, "The Medieval Mind," third American edition, Vol. I, p. 34-5.

[11]J. Dewey, "The Influence of Darwinism on Philosophy and other Essays," p. 6-7.

[12]C. M. Bakewell, "Source-Book in Ancient Philosophy," p. 233-5.

either the universe or man was like "a leaky pot or a man running at the nose," he endeavored to attain philosophic and aesthetic consolation in the contention that reality existed only in the ideal type, form or pattern, of which concrete and specific examples were but lowly, imperfect and ephemeral manifestations. Mr. Taylor has well summarized the significance of this attitude and position for the discouragement of the truly scientific approach to the study of natural phenomena:[13]

> With Platonists—and the world was always to be filled with them—perceptions of physical facts and the data of human life and history, were henceforth to constitute the outer actuality of a creation within the mind. Every observed fact is an apparent tangibility; but its reality consists in its unison with the ultimate realities of rational conception. The apprehension of the fact must be made to conform to these. For this reason every fact has a secondary, nay, primary, because spiritual meaning. Its true interpretation lies in that significance which accords with the mind's consistent system of conceptions, which present the fact as it must be thought, and therefore as it is; it is the fact brought into right relationship with spiritual and ethical verity. Of course, methods of apprehending terrestrial and celestial phenomena as illustrations of ideally conceived principles, were unlikely to foster habits of close observation. The apparent facts of sense would probably be imaginatively treated if not transformed in the process of their apprehension. Nor, with respect to the human story, would such methods draw fixed lines between the narration of what men are pleased to call the actual occurrence, and the shaping of a tale to meet the exigencies of argument or illustration.

4. Neoplatonism and the Mystic Attitude—Much more deadly to the cultivation of scientific outlook and interests was Neoplatonism, which took its origin from one of the more mystical of Plato's works, the "Timaeus." It was elaborated by Posidonius of Rhodes, and much later, by an Egyptian Platonist, Plotinus (204–270 A. D.). The world of sense-phenomena—the whole field of the work of the scientist—was utterly spurned by Plotinus as unworthy of consideration by man. The concrete and material were, at best, but a necessary evil. Plotinus is said to have expressed shame, humility and embarrassment at having possessed a physical body. The metaphysical realm of the pure contemplation of the transcendental—the ideal and divine world of Plato and Aristotle—was more highly esteemed by Plotinus than the world of sense, concrete and changing, but it was not the perfect world of mental activity. This was to be found in the regions of the Absolute, which could be reached only through vision and ecstasy. This realm of emotion and ecstasy, and its goal, the Absolute, were something in which neither observation, nor reason, nor analysis had any part whatever. The

[13]Taylor, "The Medieval Mind," Vol. I, p. 35.

Absolute was ineffable, and faith and reverence were the only proper attitudes to be maintained in its quest.[14] The intellectual bankruptcy implied in the Neoplatonic approach to the problems of knowledge and experience has thus been stated by Adolph Harnack, the famous historian of Christian thought:[15]

> The contempt for reason and science (for these are contemned when relegated to a second place) finally leads to barbarism, because it results in crass superstition, and is exposed to all manner of imposture. And, as a matter of fact, barbarism succeeded the flourishing period of Neoplatonism. . . . The masses grew up in superstition, and the Christian Church, which entered on the inheritance of Neoplatonism, was compelled to reckon with this and come to terms with it. Just when the bankruptcy of the ancient civilization and its lapse into barbarism could not have failed to reveal themselves, a kindly destiny placed on the stage of European history certain barbarian nations, for whom the work of a thousand years had as yet no existence. Thus the fact is obscured, though it does not escape the eye of one who looks below the surface, that the ancient world must necessarily have degenerated into barbarism of its own accord, because of its renunciation of this world. There was no longer any desire either to enjoy it, to master it, or to know it as it really is. A new world had been disclosed for which everything in this world was to be given up, and men were ready to sacrifice insight and understanding, in order to possess that other world with certainty. In the light which radiated from the world to come, that which in this world appeared absurd became wisdom, and wisdom became folly.

In the works and teachings of some of the followers of Plotinus the intellectual degradation proceeded much further. With Iamblichus (B. C. 300), there developed the thesis that unbounded credulity was a moral principle, that the divine methods and manifestations were essentially miraculous and supernatural, and that the chief purpose of philosophy was to inculcate the essential wickedness of disbelieving or questioning anything which related to the gods or their alleged actions. Magic and theurgy were the noblest of possible human practices.[16] Taylor has admirably summarized the mental collapse represented in the views of Iamblichus:[17]

> There was no conflict, but complete surrender and happy abandonment in Iamblichus the Divine (θεῖος) who when he prayed might be lifted ten cubits from the ground—so thought his disciples—and around whose theurgic fingers, dabbling in a magic basin of water, Cupids played and kissed each other. His life, told by the Neo-Platonic biographer, Eunapius, is as full of miracle as the contemporary Life of St. Antony by Athanasius. Iamblichus floats before us a beautiful and marvellously garbed priest,

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[14]T. Whittaker, "The Neo-Platonists"; W. R. Inge, "The Philosophy of Plotinus."

[15]A. Harnack, "History of Christian Dogma," Vol. I, p. 337-8; cited in Robinson, "The New History," p. 112-13.

[16]Whittaker, *op. cit.*, p. 122 ff.

[17]Taylor, "Medieval Mind," Vol. I, p. 47, 47-8, 48-9.

a dweller in the recesses of temples. He frankly gave himself to theurgy, convinced that the Soul needs the aid of every superhuman being—hero, god, demon, angel. He was credulous on principle. It is of first importance, he writes, that the devotee should not let the marvellous character of an occurrence arouse incredulity within him. He needs above all a "science" which shall teach him to disbelieve nothing as to the gods. For the divine principle is essentially miraculous, and magic is the open door, yes, and the way up to it, the anagogic path.

There is no lower depth. Plotinus' reason-surpassing vision of the One (which represents in him the principle of irrationality) is at last brought down to the irrational act, the occult magic deed or word. Truly the worshipper needs his best credulity—which is bespoken by Iamblichus and by this book. . . .

So low sank Neo-Platonism in pagan circles. Of course it did not create this mass of superstitious fantasy. It merely fell in cordially, and over every superstition flung the justification of its principles. In the process it changed from a philosophy to a system of theurgic practice. The common superstitions of the time, or their like, were old enough. But now—and here was the portentous fact—they had wound themselves into the natures of intellectual people; and Neo-Platonism represents the chief formal facilitation of this result.

The historical significance of Neoplatonism relates not merely to its origins and manifestations among the pagans of the period of classical decline. It furnished the intellectual framework and background for Patristic thought and provided the mental orientation for much of medieval thought and culture.[18]

5. Rhetoric and the Substitution of Well-said for Well-done—Another phase of the decadence of pagan thought was the development of the popularity of rhetoric and the love of flowery language and sonorous phrases. This not only corrupted history, but also diverted intellectual attention away from the concrete realities with which science deals, and centered interest and approval upon the aesthetic fictions of the imagination of the orator. It tended to build up a satisfaction with words and phrases, in the place of facts and concrete achievements. "Well-said" was substituted for well-done as the criterion of excellence. It was as fatal to interest and achievement in science as the Neoplatonic absorption in the ecstasies of contemplating the absolute, the miraculous and the supernatural. Professor Bury has well summarized the great popularity of rhetoric among the Greeks in the Hellenistic period:[19]

We may regret this corruption, as we call it, of history. But it is more to the purpose to understand the Greek point of view. It is not easy for us to realize the importance which the art of rhetoric possessed for

[18]A. Harnack, "History of Dogma," Vol. I, p. 336 ff.; T. Whittaker, "The Neo-platonists."

[19]J. B. Bury, "The Ancient Greek Historians," p. 174-5; cf. H. Peter, "Wahrheit und Kunst," and J. T. Shotwell, "Introduction to the History of History," Chaps. XV, XVIII.

the Greeks, as a purveyor of æsthetic pleasure. Indeed, the history of Greek rhetoric testifies, perhaps as impressively as the history of Greek plastic, to the large part which aesthetic pleasure played in Greek life. For the later Greeks, the declamations of rhetoricians, which we find intolerably tedious to read, had as intense an aesthetic value as the Homeric poems for their remote ancestors, and were listened to with as eagerly attentive and as critical ears. People went to hear a rhetorical display just as we go to hear a symphony. And this interest lasted down to late Graeco-Roman times. Greek prose was always an art in as full a sense as the poetry from which it sprang, regulated by principles and canons, which have no counterpart in modern languages, even in French, and required prolonged study and practice. And rhetoric came to fulfil for Greek audiences the same rôle which had been once fulfilled by the epics. Just as the historians, or as we should say mythologers, of the Homeric age were epic poets, so the later historians were rhetoricians. If the historian were not trained in the school of the rhetorician he would have had few readers.

Among the Romans, rhetoric, having its great expositor and defender in Quintilian, came to be even less original than among the Greeks. Mr. Taylor places it first among the "phases of pagan decadence":[20]

In general this literary decline was a decline from relevancy of treatment of subjects having real interest to irrelevancy of treatment of subjects having no real interest; from setting forth veritable features of human life to devising preposterous fictions; from large delineation of human character to the absence of any veritable and distinctive characterization of persons real or imaginary; from setting forth the course of human life according to its most truly considered laws to setting it forth in ways of happening and accident, which bear no true relation to character and situation. These decadent traits do not all appear in any one class of compositions; but those writings which exhibit them most strikingly are those which also show characteristics of medieval literature. . . . Thus these latter-day Graeco-Roman writings illustrate how the classical, or rather the Graeco-Roman, or Hellenized Roman personality, was intellectually declining to the level of the men of the early medieval times, whether barbarians by birth or native denizens of the Empire.

Rhetorical studies, and compositions of a rhetorical character, illustrate the indiscriminate use of subjects void of real interest, as well as the irrelevancy of treatment even of the subject chosen. Roman rhetoric had been a great civilizer and Romanizer of conquered provinces. The rhetorician followed hard on the army to teach the new provincials the Roman Latin literature, and in a way which fostered oratory and the faculty of turning off rhetorically proper Latin phrases. But under the Empire, oratory, whether practised at Rome or in the provinces, was emptied of its genuine purpose, which is to express opinions held upon public matters in order to influence the action of free fellow-citizens. Outside the business of the law, oratory became empty and insincere. It had its apt preparation in the schools of rhetoric, where the rounding of grammatical periods in prose or verse was everything, while pertinency to anything real in life was nothing. Subjects of study and discourse, rhetorically selected in order to cultivate cleverness of expression, do not bind the writer or speaker to pertinency to the matter in hand. Education by such means may become an education in irrelevancy for the youth of a society which is becoming more and more dilettante as it loses power to shape its destinies.

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[20]H.O. Taylor, "The Classical Heritage of the Middle Ages," p. 33-6.

The result of this rhetorical fostering of irrelevancy is seen in compositions written for an occasion, as a panegyric on an emperor. These are flatteries, if not lies. They may, however, be pertinent. But in declining times the deeds of the great man dwindle, and the orator is tempted to fill out his speech with pretty matters not quite pertinent. At last these panegyrics become models of irrelevancy. The man praised is fulsomely addressed and flattered, and great deeds are heaped on him. Then the orator may pass to regions of mythology—safe topic—nor return. This is one mark of intellectual decline; for pertinency of treatment is as indicative of intellect as is the character of the subject treated and the reality of its relationship to life. It marks one phase of Roman decline that great numbers of such panegyrics were composed, delivered, and immensely admired. They gave Symmachus his reputation; and Sidonius Apollinaris was made *praefectus urbi* as a reward for one addressed to the shadow emperor Anthemius.

6. The Seven Liberal Arts as the Approved Program of Intellectual Interests and Academic Studies—Nothing could better illustrate the decline of the place of scientific interests in classical culture than the accepted classification and program of subjects for pursuit by the intellectually inclined which took form in later paganism under the historic title of the "Seven Liberal Arts"—grammar, rhetoric, and dialectic, or the *trivium*; and geometry, arithmetic, astronomy and music, or the *quadrivium*. These subjects had been for the most part developed, distinguished and isolated as early as the time of Plato and Aristotle. Varro in his "Disciplinarum Libri Novem" had carried further the process of distinction and classification. The definitive exposition of the seven liberal arts was, however, the work of an African Neoplatonist, Martianus Capella, who lived sometime during the fourth or in the early fifth century. Taylor says of his work:[21]

Perhaps the most widely used school book of the Middle Ages was the "De Nuptiis Philologiae et Mercurii" by Martianus Capella, an African Neo-platonist, who wrote in the first part of the fifth century. It is a work in nine books. The first two are devoted to the allegorical narrative of the marriage of Mercury with the polymath virgin Philology. Mercury seeks a bride; he cannot have Sophia or Mantice or Psyche; Virtus counsels him to ask Apollo's advice, and Apollo advises him to wed Philology. Under the joyful convoy of the Muses and enzephyred by the music of the spheres, Virtus, Apollo, and the bridegroom fly to Jove's palace to ask his consent. A council of the gods is summoned; a favorable decision is reached; the bride shall be raised to divine rank. With the second book she appears, desiring the marriage, but fearful at the greatness of the honor. Her mother, Phronesis, adorns her for the wedding; four noble matrons, the cardinal virtues, greet her, and the Graces, with three mystic kisses, give her courage. Athanasia, daughter of Apotheosis, comes to lead her to Heaven, but first commands her to deliver that with which her bosom is seen to swell; at this she vomits forth many rolls of papyrus and of linen, which are gathered up by the Virgin Artes and Disciplanae, Urania and Calliope helping. The bride now drains the goblet of immortality, and rises to heaven, where Juno Pronuba meets

[21]Taylor, "Classical Heritage," p. 49-51.

her with offerings. Under the guidance of Juno, she traverses the circles of the planets and reaches the Milky Way, where Jove's palace is. There all the gods and beings known to Latin mythology assemble, with here and there a deity from Egypt, besides the guards of the elements (elementorum praesides) and a most beauteous company of the angelic folk and souls of blessed ancients. Now the bride's prudent mother demands a reading of the tables of the dower and the *lex Papia Poppaeaque*, regarding the property rights of married women. Thereupon Phoebus rises and leads forward, to place with the bridal gifts, seven maid-servants from his brother's household; these are the seven Artes—Ars Grammatica; Ars Dialectica, "a little paler"; Rhetorica; Geometria; Arithemetica; Astronomia; Harmonia. Each one, as Phoebus leads her forward, tells her parentage, and then expounds the substance of her art, most dryly, all virginal allegory laid aside. They have a book apiece, and make up the tale of the nine books of Capella.

This work became the "standard" school book of the Middle Ages. Its form and character anticipates medieval taste, upon which it was to be so influential. It is written in prose and verse, the *chantefable* form; though the song-element is unimportant in the last seven books. These are strictly instructive, and sapless as the rods of medieval schoolmasters. The allegory of the first two books is pleasingly pedantic and the whole work presents the sterile union of fantasy with pedantry, so dear to the closing years of pagan scholarship, when the old straw was thrashed, re-tied in queer-shaped bundles, and then thrashed again. The process produced *pabulum* for coming generations.

The hierarchy of the seven arts was elaborated by Boethius and others, and typical medieval text-books on the arts were provided by Cassiodorus. The concentration of the learned upon the seven liberal arts distinctly diverted their attention from both science and the scientific attitude. Of the two divisions of the arts the *trivium* was much more highly esteemed than the *quadrivium*, and, during the Middle Ages, received the bulk of the concern of students.[22] Even the *quadrivium* itself did not contain the more promising and practical sciences, but merely the most logical and formal. Further, geometry, arithmetic and astronomy did not mean in their medieval content what they did in Hellenistic days or what they do now. Rather, they were chiefly concerned with formal definition and the magic potency of numbers and celestial phenomena.[23] There was, then, nothing in the seven liberal arts which could promote science and little which would not discourage it. With the coming of Christianity the seven liberal arts were regarded as but the hand-maidens of theology, which immediately became the "Queen of the Sciences."

7. *The Indiscriminate Compilation of Compendia of Pseudo-Scientific Data and Superstitious Tradition*—One of the most conspicuous aspects of the pagan decadence and something

[22]L. J. Paetow, "The Arts Course in the Medieval Universities," p. 2 ff.
[23]E. Brehaut, "An Encyclopedist of the Dark Ages: Isidore of Seville," p. 89-154.

which was continued by Christian scholars, was the tendency towards producing enormous compilations of alleged scientific material, accepting tradition, gossip and hearsay as the basis, instead of endeavoring to acquire however small an amount of new knowledge by the patient method of inductive investigation. While some of the best of the earliest of these compilations unquestionably embodied the prevailing scientific notions of their day, they invariably and inevitably included also much pseudo-scientific tradition, and in no case could they add anything to the sum total of human knowledge. The very best compilation is necessarily inferior to the poorest laboratory investigation as a means of extending our scientific information. Most of these compilations, however, embraced but little of the Athenian or Hellenistic science and came more and more to embody the wildest guesses and the crudest superstitions, to which were added by the Christian compilers the miraculous, the allegorical and the anagogical. This process of compilation began, and appeared at its best, in Aristotle. Its course of development and cumulative degradation runs on through Varro's works, Pliny's "Natural History," Ptolemy's "Almagest," the compilations of Boethius, Cassiodorus, and Gregory the Great, Isidore of Seville's "Etymologies," Rhabanus Maurus' "De Universo," Alexander Neckham's "De Naturis Rerum," and Vincent of Beauvais' "Speculum."[24] Mr. Taylor thus summarizes the significance of this compiling tendency for the history of thought and science:[25]

> For the Latin West the creative patristic epoch closes with the death of Augustine. There follows a period marked by the cessation of intellectual originality. Men are engaged upon translations from the Greek; they are busy commenting upon older writings, or are expounding with a change of emphasis the systematic constructions of their predecessors. Epitomes and compendia appear, simplified and mechanical abstracts of the bare elements of inherited knowledge and current education. Compilations are made, put together of excerpts taken unshriven and unshorn into the compiler's writing. Knowledge is brought down to a more barbaric level. Yet temperament lingers for a while, and still appears in the results.
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> The representatives of this post-patristic period of translation, comment, and compendium, and of re-expression with temperamental change of emphasis, are the two contemporaries, Boethius and Cassiodorus; then Gregory the Great, who became pope soon after Cassiodorus closed his eyes at the age of ninety or more; and, lastly, Isidore, Archbishop of Seville, who died in 636, twenty-two years after Gregory. All these were Latin bred, and belonged to the Roman world rather than to those new peoples whose barbarism was hastening the disruption of a decadent order, but whose recently converted zeal was soon to help on the further

[24]See selections from such compilations in Brehaut, *op. cit., passim*, R. Steele, "Medieval Lore," and G. G. Coulton, "A Medieval Garner."

[25]Taylor, "Mediaeval Mind," Vol. I, p. 88-9.

diffusion of Latin Christianity. They appear as transmitters of antique and patristic thought; because, originating little, they put together matter congenial to their own lowering intellectual predilections, and therefore suitable mental pabulum for times of mingled decadence and barbarism, and also for the following periods of medieval re-emergence which continued to hark back to the obvious and the easy.

Instead of transmitters, a word indicating function, one might call these men *intermediaries*, and so indicate their position as well as rôle. Both words, however, should be taken relatively. For all the Fathers heretofore considered were in some sense transmitters or intermediaries, even though creative in their work of systematizing, adding to, or otherwise transforming their matter. Yet one would not dub Augustine a transmitter, because he was far more of a remaker or creator. But a dark refashioner indeed will Gregory the Great appear; while Boethius, Cassiodorus, Isidore are rather sheer transmitters, or intermediaries, the last-named worthy destined to be the most popular of them all, through his unerring faculty of selecting for his compilations the foolish and the flat.

8. The Decline of the Older Greek and Roman Paganism and the Rise of the Emotional Mystery Cults—What cultural historians regard as the most important psychological change which took place during classical paganism came during the first centuries of the Christian era. It consisted in the transformation of the religious disposition of the Roman Empire.[26] The old stereotyped and relatively unemotional and non-individualized religion of the early agricultural Republic gradually lost its vitality and died out in the face of the competition of the newly discovered oriental cults which the Roman legions and sailors were bringing back with them to Italy. These new mysteries—that of the Great Mother Goddess of Phrygia, that of the Invincible Sun of Syria, the Egyptian cult of Isis and Serapis, and the Persian mystery of Mithra—were designed to play upon the emotions of the individual, bringing a consciousness of sin, a desire for salvation and purification, and a promise of eternal life in a future world. They prepared the way for the emotionalism and otherworldliness of Christianity, both of which were highly destructive of the calm imperturbability and mundane interests of the natural scientist.[27] Particularly significant is the fact that these oriental mysteries captured the learned classes as well as the masses, while the great minds of earlier paganism had remained for the most part sceptical of the older state religion and popular cults. Franz Cumont, the most eminent authority upon this phase of classical history, thus describes this great religious transformation which was

[26]W. Warde Fowler, "The Religious Experience of the Roman People," "Lectures XVII-XIX; F. Cumont, "Oriental Religions in Roman Paganism," Chap. II, and "The Mysteries of Mithra."

[27]Cumont, "Oriental Religions," *passim.*

to be carried further by Christianity, itself regarded by contemporaries as but one more mystery cult:[28]

In very early times Greece—later imitated by Rome—became resolutely rationalistic; her greatest originality lies here. Her philosophy was purely laical; thought was unrestrained by any sacred tradition; it even pretended to pass judgment upon these traditions and condemned or approved of them. Being sometimes hostile, sometimes indifferent and sometimes conciliatory, it always remained independent of faith. But while Greece thus freed herself from the fetters of a superannuated mythology, and openly and boldly constructed those systems of metaphysics by means of which she claimed to solve the enigmas of the universe, her religion lost its vitality and dried up because it lacked the strengthening nourishment of reflection. It became a thing devoid of sense, whose *raison d'être* was no longer understood; it embodied dead ideas and an obsolete conception of the world. In Greece as well as at Rome it was reduced to a collection of unintelligible rites, scrupulously and mechanically reproduced without addition or omission because they had been practised by the ancestors of long ago, and formulas hallowed by the *mos maiorum*, that were no longer understood or sincerely cherished. Never did a people of advanced culture have a more infantile religion. . . .

To recapitulate, the Oriental religions acted upon the senses, the intellect and the conscience at the same time, and therefore gained a hold on the entire man. Compared with the ancient creeds, they appear to have offered greater beauty of ritual, greater truth of doctrine and a far superior morality. The imposing ceremonial of their festivities and the alternating pomp and sensuality, gloom and exaltation of their services appealed especially to the simple and the humble, while the progressive revelation of ancient wisdom, inherited from the old and distant Orient, captivated the cultured mind. The emotions excited by these religions and the consolations offered strongly attracted the women, who were the most fervent and generous followers and the most passionate propagandists of the religions of Isis and Cybele. Mithra was worshipped almost exclusively by men, whom he subjected to a rigid moral discipline. Thus souls were gained by the promise of spiritual purification and the prospect of eternal happiness.

The worship of the Roman gods was a civic duty, the worship of the foreign gods the expression of a personal belief. The latter were the objects of the thoughts, feelings and intimate aspirations of the individual, not merely of the traditional and, one might say, functional adoration, of the citizen. The ancient municipal devotions were connected with a number of earthly interests that helped to support each other. They were one of various forms of family spirit and patriotism and guaranteed the prosperity of the community. The Oriental mysteries, directing the will toward an ideal goal and exalting the inner spirit, were less mindful of economic utility, but they could produce that vibration of the moral being that caused emotions, stronger than any rational faculty, to gush forth from the depths of the soul. Through a sudden illumination they furnished the intuition of a spiritual life whose intensity made all material happiness appear insipid and contemptible. This stirring appeal of supernatural life made the propaganda irresistible. The same ardent enthusiasm guaranteed at the same time the uncontested domination of neo-Platonism among the philosophers. Antiquity expired and a new era was born.

9. The Rise of Pagan Diabolism and Eschatology—Growing in large part out of the acceptance of these Oriental mystery

[28] *Ibid.*, p. 31, 43-5.

cults, particularly out of Mithraism and the Persian influences, was the development of a belief in cosmic dualism, diabolism and eschatology and the growth of a dominating interest in "last things."[29] The distinction between good and evil spirits and a belief in their interference in human affairs has been common among all peoples where the scientific spirit has not gained ascendency, but the idea of the universe as an arena specifically created for the struggle between the principles and personified powers of good and evil was a concept which came to the classical world from the Persian tradition of the duel of Ormuzd and Ahriman. This notion not only prepared the way for the development of the sordid Christian diabolism, but was the actual historical source of the derivation of this belief.[30] As Cumont says:[31]

> In his treatise against the magi, Theodore of Mopsuestia speaks of Ahriman as Satan. At first sight there really is a surprising resemblance between the two. Both are heads of a numerous army of demons; both are spirits of error and falsehood, princes of darkness, tempters and corrupters. An almost identical picture of the pair could be drawn, and in fact they are practically the same figure under different names. It is generally admitted that Judaism took the notion of an adversary of God from the Mazdeans along with portions of their dualism. It was therefore natural that Jewish doctrine, of which Christianity is heir, should have been closely allied to the mysteries of Mithra. A considerable part of the more or less orthodox beliefs and visions that gave the Middle Ages their nightmare of hell and the devil thus came from Persia by two channels: on the one hand Judeo-Christian literature, both canonical and apocryphal; and on the other, the remnants of the Mithra cult and the various sects of Manicheism that continued to preach the old Persian doctrines on the antagonism between the two world principles.

Intimately related to this was the Persian belief in a final cataclysmic close of this cosmic duel, the discomforting of Ahriman and the powers of darkness, the destruction of his followers, and the eternal bliss of the faithful who had chosen to support Ormuzd and had aided their saviour, Mithra. The Greeks and Romans had possessed no very clear or vital conception of immortality and had not taken any conspicuous interest in "last things," but, with the wide-spread acceptance of the Persian eschatology, the attention of men became more and more directed towards preparation for death rather than for life, and towards the assurance of immortal existence rather than towards the concern with the affairs of this world.[32] This culminated in the Patristic attitude, best reflected in Augustine's "City of God," in which earthly existence was

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[29]R. H. Charles, "A Critical History of the Doctrine of a Future Life."
[30]A. Reville, "The Devil: His Origin, Greatness and Decadence."
[31]Cumont, "Oriental Religions," p. 153-4.
[32]Charles, *op. cit.*; Cumont, Chaps. II, VI, VIII.

pictured as but an ephemeral and inferior experience, designed solely to test fitness for entry into the blessed immortality of the elect in the City of God. For such as espoused these beliefs, science had less than any attraction.

III. The More Important Aspects of the Christian or Patristic Cultural Tradition Which Made Impossible the Flourishing of Natural Science

1. Syncretic Nature of Christianity—The obstruction of scientific development by orthodox theological notions is a matter which is common knowledge among historians and scientists, owing to the remarkable exposition of the subject by J. W. Draper, Andrew D. White, J. M. Robertson, J. B. Bury and others, and calls for nothing more than a brief summary in this paper.

Both critics and apologists of Christianity have usually erred in analyzing the influence of Christianity upon the culture of the later Roman Empire and the Middle Ages. Sceptical and critical students have normally assigned to Christianity full responsibility for the intellectual and cultural degradation of the first millennium of the Christian era. Christian apologists, on the other hand, have been wont to follow Orosius in picturing the pagan past as one of umixed sin, misery, corruption and ignorance, and in representing Christianity as having introduced an altogether new and higher form of moral and intellectual life. If the above discussion of the decline of pagan learning has demonstrated anything, it must have made it clear that, without any Christian influences whatever, the cultural conditions of the later classical period would have effectively stifled all or most productive scientific effort. On the other hand, it is equally clear that Christianity did not help matters at all, but rather contributed to the pre-existing tendencies towards intellectual degradation. It added relatively little which was new to the intellectual tendencies of the times, but was chiefly a synthesis of the culture of the period. As Professor Robinson has well described the facts in the case: "It has been the habit of Christian apologists to contrast Christianity, pure and undefiled, with an unspeakable 'paganism' or idol worship. Historical Christianity now appears to the modern student of comparative religion to have been the highly complex result of a long development, and to resemble in certain important respects a number of world religions—Stoicism, Hellenistic paganism, Neoplatonism, Mithraism, Manichaeism, Judaism (all of which carried over with them more primitive elements)—with which it found itself in

rivalry during the early centuries of its existence. It was the product of religious *syncretism*, a process of unconscious borrowing and lending."[33]

2. *Christian Cosmology, Teleology and Eschatology*—Perhaps the most significant contribution of Christianity to the anti-scientific movement lay in the general *Weltanschauung* which it wrought out for itself from the many religious and intellectual currents of the Roman Empire. It accepted the Persian view of cosmic dualism—the world as the arena of the contest between good and evil—substituting Yahweh and Christ for Ormuzd and Mithra, and Satan or the Devil for Ahriman, as the leaders of the hosts of righteousness and evil.[34]

This view of cosmology furnished a most significant impulse to the vigorous Christian teleology. There was no event in history and no aspect of natural phenomena which failed to reflect this great cosmic struggle. There was a divine purpose in all creation and all existence. History and "science" were useful only in so far as they aided one in understanding this divine purpose, and in better adapting his personal existence to its fulfilment. As Professor Robinson well says:[35]

> One of the greatest contrasts between medieval thinking and the more critical thought of to-day lies in the general conception of man's relation to the cosmos. To the medieval philosopher, as to the stupidest serf of the time, the world was made for man. All the heavenly bodies revolved about man's abode as their center. All creatures were made to assist or to try man. God and the devil were preoccupied with his fate, for had not God made him in his own image for his glory, and was not the devil intent on populating his own infernal kingdom? It was easy for those who had a poetic turn of mind to think of nature's working as symbols for man's edification. The habits of the lion or the eagle yielded moral lessons or illustrated the divine scheme of salvation. Even the written word was to be valued, not for what it seemed to say, but for hidden allegories depicting man's struggles against evil and cheering him on his way.

Even more than the Persians the Christians were interested in eschatology, which was the Christian analogue or, rather, antithesis, of the modern theory of progress. The creation and existence of the world and the life of all creatures upon it had, as the underlying *rationale* of their existence and the desirable orientation of their activities, the securing of the final triumph

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[33]J. H. Robinson, "An Outline of the History of the Western European Mind," p. 17. The best available treatments of the syncretic nature of Christianity are F. C. Conybeare, "Myth, Magic and Morals"; T. R. Glover, "The Conflict of Religions in the Roman Empire"; P. Gardner, "Exploratio Evangelica"; and W. R. Cassels, "Supernatural Religion."

[34]M. N. Dhalla, "Zoroastrian Theology," Chaps. XVIII, XXX.

[35]Robinson, "Mind in the Making," p. 142-3.

of good over evil, the destruction of the Devil and his forces, and the salvation of God's creatures from the fiery torture which awaited the servants of sin after the last great cataclysmic overthrow of Satan and his cohorts. "This was especially true in the Middle Ages," says Professor Robinson. "During these centuries men's single objective was the assurance of heaven and escape from hell. Life was an angry river into which men were cast. Demons were on every hand to drag them down. The only aim could be, with God's help, to reach the celestial shore. There was no time to consider whether the river might be made less dangerous by concerted effort, through the deflection of its torrents and the removal of its sharpest rocks. No one thought that human efforts should be directed to making the lot of humanity progressively better by intelligent reforms in the light of advancing knowledge."[36] This majestic illusion, created by the synthetic capacity of the Patristic mind, and best set forth in Augustine's "City of God," so destructive of any justification of scientific interest in the concrete and fleeting things of this earth, has been most eloquently described by Santayana in his summary of the "Christian Epic":[37]

There was in the beginning, so runs the Christian story, a great celestial King, wise and good, surrounded by a court of winged musicians and messengers. He had existed from all eternity, but had always intended, when the right moment should come, to create temporal beings, imperfect copies of himself in various degrees. These, of which man was the chief, began their career in the year 4004 B. C., and they would live on an indefinite time, possibly, that chronological symmetry might not be violated, until A. D. 4004. The opening and close of this drama were marked by two magnificent tableaux. In the first, in obedience to the word of God, sun, moon, and stars, and earth with all her plants and animals, assumed their appropriate places, and nature sprang into being with all her laws. The first man was made out of clay, by a special act of God, and the first woman was fashioned from one of his ribs, extracted while he lay in a deep sleep. They were placed in an orchard where they often could see God, its owner, walk in the cool of the evening. He suffered them to range at will and eat of all the fruits he had planted save that of one tree only. But they, incited by a devil, transgressed this single prohibition, and were banished from that paradise with a curse upon their head, the man to live by the sweat of his brow and the woman to bear children in labour. These children possessed from the moment of conception the inordinate natures which their parents had acquired. They were born to sin and to find disorder and death everywhere within and without them.

At the same time God, lest the work of his hands should wholly perish, promised to redeem in his good season some of Adam's children and restore them to a natural life. This redemption was to come ultimately through a descendant of Eve, whose foot should bruise the head of the serpent. But it was to be prefigured by many partial and special redemp-

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[36] *Ibid.*, p. 137.

[37] G. Santayana, "The Life of Reason: Reason in Religion," p. 92-7.

tions. Thus, Noah was to be saved from the deluge, Lot from Sodom, Isaac from the sacrifice, Moses from Egypt, the captive Jews from Babylon, and all faithful souls from heathen forgetfulness and idolatry. For a certain tribe had been set apart from the beginning to keep alive the memory of God's judgments and promises, while the rest of mankind, abandoned to its natural depravity, sank deeper and deeper into crimes and vanities. The deluge that came to punish these evils did not avail to cure them. "The world was renewed and the earth rose again above the bosom of the waters, but in this renovation there remained eternally some trace of divine vengeance. Until the deluge all nature had been exceedingly hardy and vigorous, but by that vast flood of water which God had spread out over the earth, and by its long abiding there, all saps were diluted; the air, charged with too dense and heavy a moisture, bred ranker principles of corruption. The early constitution of the universe was weakened, and human life, from stretching as it had formerly done to near a thousand years, grew gradually briefer. Herbs and roots lost their primitive potency and stronger food had to be furnished to man by the flesh of other animals. . . . Death gained upon life and men felt themselves overtaken by a speedier chastisement. As day by day they sank deeper in their wickedness, it was but right they should daily, as it were, stick faster in their woe. The very change in nourishment made manifest their decline and degradation, since as they became feebler they became also more voracious and blood-thirsty."

Henceforth there were two spirits, two parties, or, as Saint Augustine called them, two cities in the world. The City of Satan, whatever its artifices in art, war, or philosophy, was essentially corrupt and impious. Its joy was but a comic mask and its beauty the whitening of a sepulchre. It stood condemned before God and before man's better conscience by its vanity, cruelty, and secret misery, by its ignorance of all that it truly behoved a man to know who was destined to immortality. Lost, as it seemed, within this Babylon, or visible only in its obscure and forgotten purlieus, lived on at the same time the City of God, the society of all the souls God predestined to salvation; a city which, however humble and inconspicuous it might seem on earth, counted its myriad transfigured citizens in heaven, and had its destinies, like its foundations, in eternity. To this City of God, belonged, in the first place, the patriarchs and the prophets who, throughout their plaintive and ardent lives, were faithful to what echoes still remained of a primeval revelation, and waited patiently for the greater revelation to come. To the same city belonged the magi who followed a star till it halted over the stable in Bethlehem; Simeon, who divined the present salvation of Israel; John the Baptist, who bore witness to the same and made straight its path; and Peter, to whom not flesh and blood, but the spirit of the Father in heaven, revealed the Lord's divinity. For salvation had indeed come with the fulness of time, not, as the carnal Jews had imagined it, in the form of an earthly restoration, but through the incarnation of the Son of God in the Virgin Mary, his death upon a cross, his descent into hell, and his resurrection at the third day according to the Scriptures. To the same city belonged finally all those who, believing in the reality and efficacy of Christ's mission, relied on his merits and followed his commandment of unearthly love.

All history was henceforth essentially nothing but the conflict between these two cities; two moralities, one natural, the other supernatural; two philosophies, one rational, the other revealed; two beauties, one corporeal, the other spiritual; two glories, one temporal, the other eternal; two institutions, one the world, the other the Church. These, whatever, their momentary alliances or compromises, were radically opposed and funda-

mentally alien to one another. Their conflict was to fill the ages until, when wheat and tares had long flourished together and exhausted between them the earth for whose substance they struggled, the harvest should come; the terrible day of reckoning when those who had believed the things of religion to be imaginary would behold with dismay the Lord visibly coming down through the clouds of heaven, the angels blowing their alarming trumpets, all generations of the dead rising from their graves, and judgment without appeal passed on every man, to the edification of the universal company and his own unspeakable joy or confusion. Whereupon the blessed would enter eternal bliss with God their master and the wicked everlasting torments with the devil whom they served.

The drama of history was thus to close upon a second tableau: long-robed and beatified cohorts passing above, amid various psalmodies, into an infinite luminous space, while below the damned, howling, writhing, and half transformed into loathsome beasts, should be engulfed in a fiery furnace. The two cities, always opposite in essence, should thus be finally divided in existence, each bearing its natural fruits and manifesting its true nature.

This synthesis of the Patristic view was doubly deadly to science on account of the authoritative way in which it was inculcated for a thousand years. Professor Robinson says:[38]

This general account of man, his origin and fate, embraced in the Christian Epic, was notable for its precision, its divine authenticity, and the obstacles which its authority consequently presented to any revision in the light of increasing knowledge. The fundamental truths in regard to man were assumed to be established once and for all. The Greek thinkers had had little in the way of authority on which to build, and no inconsiderable number of them frankly confessed that they did not believe that such a thing could exist for the thoroughly sophisticated intelligence. But medieval philosophy and science *were grounded wholly in authority*. The medieval schoolmen turned aside from the hard path of skepticism, long searchings and investigation of actual phenomena, and confidently believed that they could find truth by the easy way of revelation and the elaboration of unquestioned dogmas.

This reliance on authority is a fundamental primitive trait. We have inherited it not only from our medieval forefathers, but, like them and through them, from long generations of prehistoric men. We all have a natural tendency to rely upon established beliefs and fixed institutions. This is an expression of our spontaneous confidence in everything that comes to us in an unquestioned form. As children we are subject to authority and cannot escape the control of existing opinion. We unconsciously absorb our ideas and views from the group in which we happen to live. What we see about us, what we are told, and what we read has to be received at its face value so long as there are no conflicts to arouse skepticism.

We are tremendously suggestible. Our mechanism is much better adapted to credulity than to questioning. All of us *believe* nearly all the time. Few doubt, and only now and then. The past exercises an almost irresistible fascination over us. As children we learn to look up to the old, and when we grow up we do not permit our poignant realization of elderly incapacity among our contemporaries to rouse suspicions of Moses, Isaiah, Confucius, or Aristotle. Their sayings come to us unquestioned; their remoteness makes inquiry into their competence impossible. We readily assume that they had sources of information and wisdom superior to the prophets of our own day.

[38]Robinson, "Mind in the Making," p. 126-8.

3. Asceticism and the Emphasis upon Withdrawal from Worldly Occupations and Mundane Interests—In view of the Patristic emphasis on the supreme importance of securing entry on a favorable basis into the world to come, and the related warning against absorption with mundane matters, it is not surprising that a large group of Christians in the early Middle Ages separated themselves from the majority of mankind and devoted themselves entirely, in theory at least, to spiritual exercises, which they believed would insure their certain salvation.[39] While this precaution seems rather superfluous, in view of the prevailing dogmas as to the efficacy of the sacramental scheme of salvation, yet the popularity of the monastic life is not to be wondered at in the light of the philosophy of life which dominated the Patristic period. Withdrawal from the world was certainly additional insurance against its seductions. The intensity of the emotional complex which prompted the ascetic career can be discerned in the following citation from Saint Jerome's exhortation to escape the dangerous attractions of earthly cares and joys and to enter upon the holy life of the monk:[40]

Though your little nephew twine his arms around your neck; though your mother, with disheveled hair and tearing her robe asunder, point to the breast with which she nourished you; though your father fall down on the threshold before you, pass on over your father's body. Fly with tearful eyes to the banner of the cross. In this matter cruelty is the only piety. . . . Your widowed sister may throw her gentle arms around you. . . . Your father may implore you to wait but a short time to bury those near to you, who will soon be no more. Your weeping mother may recall your childish days, and may point to her shrunken breast and to her wrinkled brow. Those around you may tell you that all the household rests upon you. Such chains as these the love of God and the fear of hell can easily break. You say that Scripture orders you to obey your parents, but he who loves them more than Christ loses his soul. The enemy brandishes a sword to slay me. Shall I think of a mother's tears?

(When once his friend has cast off the responsibilities of the world he will discover that the desert is full of attractions.) O solitude, whence are brought the stones of the city of the Great King! O wilderness rejoicing close to God! What would you, brother, in the world,—you that are greater than the world? How long are the shades of roofs to oppress you? How long the dungeon of a city's smoke? Believe me, I see more of light! How refreshing to cast off the things that oppress the body and fly away into the pure sparkling ether!

Do you fear poverty? Christ called the poor "blessed." Are you terrified at labor? No athlete without sweat is crowned. Do you think of food? Faith fears not hunger. Do you dread the naked ground for limbs consumed with fasts? The Lord lies with you. Does the thought of unkempt locks disturb you? Your head is Christ. Does the infinite vastness of the desert affright you? In the mind walk abroad in Paradise.

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[39]Taylor, "Classical Heritage of the Middle Ages," Chap. VII.
[40]Robinson, "Readings in European History," Vol. I, p. 86-7.

So often as you do this there will be no desert. Does your skin roughen without baths? Who is once washed in Christ needs not to wash again. In a word, hear the apostle as he answers: "The sufferings of the present time are not worthy to be compared with the glory which shall be revealed in us!" You are too pleasure-loving, brother, if you wish to rejoice in this world and hereafter to reign with Christ!

Some have contended that the monastic life was an impulse to scientific activity and have pointed to the example of scientific achievements by monks from the time of Albertus Magnus and Roger Bacon to Gregor Mendel, but it must not be forgotten that the scholarly and scientific activities of the monks were incidental to their avowed concentration on spiritual matters. Indeed, one may go further and say that all the scientific activity they carried on was consciously or unconsciously a complete negation of the basic justification of the monastic career. As a matter of fact according to the authoritative opinion of Augustine, all science and secular learning, past and present, belonged essentially to the City of the Devil.

4. Allegory, Symbolism and Vagueness of Expression—Allegory and symbolism were no innovation of Christianity. They were present in both Oriental and Classical thought, particularly in Hellenistic Judaism and in Neoplatonism.[41] But Christianity supplied additional impulses. With the acceptance of the orthodox view of the literal inspiration and complete harmony of the Scriptures, it became necessary to resort to allegorical interpretation in order to explain away obvious discrepancies, to excuse incidents of conduct not appropriate in the chosen servants of God, and to interpret literal impossibilities. Another impulse came from teleology and eschatology. If all incidents or events were linked together as a part of the majestic scheme of universal orientation and purpose, one should seek in all things, particularly in the Scriptures, a deeper and loftier meaning than that which appears in the literal sense of the passage.[42] The most effective exponent of the allegorical method was the great Alexandrian Father, Origen. Shotwell and Conybeare have well stated Origen's justification of this procedure:

Interpretation of the scriptures by allegory is not, in Origen's eyes, an unwarranted liberty. The scriptures themselves sanction it—allegorically! "There is a hidden and secret meaning," he says, "in each individual word. The treasure of divine wisdom is hid in the vulgar and unpolished vessels of words; as the apostle also points out when he says, 'We have this treasure in earthen vessels.'" Quaintly naïve as such reasoning seems when based upon a single text, its weakness becomes its

[41]Taylor, "Classical Heritage of the Middle Ages," p. 90 ff.
[42]Taylor, "Medieval Mind," Vol. II, Chap. XXVIII.

strength when sufficient texts are adduced, to convey the impression that the scriptures themselves do really proclaim their own symbolic character. This Origen endeavors to do. "If the texts of Moses had contained nothing which was to be understood as having a secret meaning, the prophet would not have said in his prayer to God: 'Open thou mine eyes and I will behold wondrous things out of thy law (Psalms, 119-18).'" What, he asks, can one make out of the prophecy of Ezekiel except allegorically? Prophetic literature implies allegory in its very structure. But the strongest proof of the legitimacy of allegorical interpretation is its use in the New Testament, and so largely by St. Paul.[43]

Wherever, Origen argues, we meet with such useless, nay impossible, incidents and precepts as these, we must discard a literal interpretation and consider of what moral interpretation they are capable, with what higher and mysterious meaning they are fraught, what deeper truths they were intended symbolically and in allegory to shadow forth. The divine wisdom has of set purpose contrived these little traps and stumbling-blocks in order to cry halt to our slavish historical understanding of the text, by inserting in its midst sundry things that are impossible and unsuitable. The Holy Spirit so waylays us in order that we may be driven by passages which taken in their *primafacie* sense cannot be true or useful, to search for the ulterior truth, and seek in the Scriptures which we believe to be inspired by God a meaning worthy of Him.[44]

The absurdities of the allegorical method and symbolism, and the vast gulf which separates them from the scientific procedure can, perhaps, best be illustrated by two typical passages, one from the Epistle of Barnabas and the other from Gregory the Great's "Moralia" or commentary on the Book of Job:

Now what do you suppose this to be a type of, that a command was given to Israel, that men of the greatest wickedness should offer a heifer, and slay and burn it, and that then boys should take the ashes, and put these into vessels, and bind round a stick purple wool along with hyssop, and that thus the boys should sprinkle the people, one by one, in order that they might be purified from their sins? Consider how He speaks to you with simplicity. The calf is Jesus: the sinful men offering it are those who lead Him to the slaughter. But now the men are no longer guilty, are no longer regarded as sinners. And the boys that sprinkle are those that have proclaimed to us the remission of sins and purification of heart. To these He gave the authority to preach the gospel, being twelve in number, corresponding to the twelve tribes of Israel. But why are there three boys that sprinkle? To correspond to Abraham, and Isaac, and Jacob, because these were great with God. And why was the wool (placed) upon the wood? Because by wood Jesus holds His kingdom, so that (through the cross) those believing on Him shall live for ever. But why was hyssop joined with the wool? Because in His kingdom the days will be evil and polluted in which we shall be saved, (and) because he who suffers in body is cured through the cleansing efficacy of hyssop. And on this account the things which stand thus are clear to us, but obscure to them, because they did not hear the voice of the Lord.[45]

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[43]J. T. Shotwell, in *Journal of Philosophy, Psychology and Scientific Methods*, February 26, 1920, p. 115-6.

[44]F. C. Conybeare, "A History of New Testament Criticism," p. 14-5.

[45]The Epistle of Barnabas, in "Apostolic Fathers," Ante-Nicene Christian Library, Vol. I, p. 114-5.

(The manner of this allegorical interpretation, so popular throughout the Middle Ages, may be illustrated by Gregory's commentary on the statement that Job possessed, among other property, "five hundred yoke of oxen and five hundred she asses.")

We have said above that by the number fifty, which is completed by seven weeks and the addition of an unit, rest is signified, and by the number ten the sum of perfection is set forth. Now, forasmuch as the perfection of rest is promised to the faithful, by multiplying fifty ten times, we arrive at five hundred. But in Sacred Writ the title of oxen sometimes represents the dullness of the foolish sort, and sometimes the life of well-doers. For because the stupidity of the fool is represented by the title of an ox, Solomon says rightly, "He goeth after her straightway, as an ox goeth to the slaughter." Again, that the life of every laborer is set forth by the title of oxen, the precepts of the Law are a testimony, which enjoined through Moses, "Thou shalt not muzzle the ox when he treadeth out the corn." And this again is declared in plain words, "The labourer is worthy of his hire."

By the title of asses, too, we have represented sometimes the unrestrained indulgence of the wanton, sometimes the simple-mindedness of the Gentiles; for the inertness of fools is imaged by the designation of asses, as where it is said through Moses, "Thou shalt not plough with an ox and an ass together." As though he said, "Do not associate fools and wise men together in preaching, lest by means of him who has no power to accomplish the work you hinder him who has abundant power." The unrestrained indulgence of the wanton is likewise set forth by the appellation of asses, as the prophet testifies when he says, "whose flesh is as the flesh of asses."

Again, by the title asses is shown the simplicity of the Gentiles. Hence, when the Lord went up to Jerusalem, he is related to have sat upon a young ass. For what is it for him to come to Jerusalem sitting upon an ass, except taking possession of the simple hearts of the Gentiles to conduct them to the vision of peace, by ruling and ordering them? And this is shown by one passage, and that a very easy one, in that both the workmen of Judea are represented by oxen, and the Gentile peoples by an ass, when it is said by the prophet, "The ox knoweth his owner, and the ass his master's crib." For who appears as the ox saving the Jewish people, whose neck was worn by the yoke of the Law? And who was the ass but the Gentile world, which was like a brute animal readily seduced by every deceiver, for he did not resist by exercise of reason?[46]

This development of allegory and symbolism was not only obstructive of the general attitude of scientific endeavor, it even colored the content of the pseudo-science of the period. Stones, plants and animals were supposed to possess magic qualities and symbolically to shadow forth divine verities or spiritual values.[47] "Natural science," says Professor Robinson, "like history, was only valuable as illustrating God's ways to man. Magic was useful to foretell the future, heal the sick, and to make gold."[48] The following citation

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[46]Selection from the "Moralia" in Robinson, "Readings in European History," Vol. I, p. 79-80.

[47]L. Thorndike, "The Place of Magic in the Intellectual History of Europe."

[48]J. H. Robinson, "History of the Western European Mind," p. 25.

from Mr. Taylor's paraphrase of a section of the "Physiologus," a much used work on natural history during the Patristic period, will constitute a sufficient illustration of the so-called "theistic biology" so characteristic of the prevailing symbolism of all branches of Patristic "science":[49]

> Well known as these stories are, one or two examples may be given to recall their character: The Lion has three characteristics; as he walks or runs he brushes his foot-prints with his tail, so that the hunters may not track him. This signifies the secrecy of the Incarnation—of the Lion of the tribe of Judah. Secondly, the Lion sleeps with his eyes open; so slept the body of Christ upon the Cross, while His Godhead watched at the right hand of the Father. Thirdly, the Lioness brings forth her cub dead; on the third day the father comes and roars in its face, and wakes it to life. This signifies the Lord's resurrection on the third day.
>
> The Pelican is distinguished by its love for its young. As these begin to grow they strike at their parents' faces, and the parents strike back and kill them. Then the parents take pity, and on the third day the mother comes and opens her side and lets the blood flow on the dead young ones, and they become alive again. Thus God cast off mankind after the Fall, and delivered them over to death; but He took pity on us, as a mother, for by the Crucifixion He awoke us with His blood to eternal life.
>
> The Unicorn cannot be taken by hunters, because of his great strength, but lets himself be captured by a pure virgin. So Christ, mightier than the heavenly powers, took on humanity in a virgin's womb.
>
> The Phoenix lives in India, and when five hundred years old fills his wings with fragrant herbs and flies to Heliopolis, where he commits himself to the flames in the Temple of the Sun. From his ashes comes a worm, which the second day becomes a fledgling, and on the third a full-grown phoenix, who flies away to his old dwelling-place. The Phoenix is the symbol of Christ; the two wings filled with sweet-smelling herbs are the Old and New Testaments, full of divine teaching.

Another expedient of the Patristic mind in evading the concrete direct and specific methods of science was the realization of the "resources of vagueness of expression" in matters of dialectic and of doctrinal exegesis. Augustine clearly sets forth his appreciation of the possible virtue of ambiguity in his "Confessions," where he says, "I assuredly,—and this I assert without apprehension and from the bottom of my heart,—if I were writing something of most unquestioned credibility, should prefer so to write that my words should convey whatever truth concerning the things in question any person might be able to compass, rather than to write in such a fashion that I should express a single true idea with such a degree of clarity that I should exclude all other ideas the falsity of which would not be able to trouble me."[50]

5. The Flourishing of the Miraculous and the Notion of a "God of Arbitrariness"—The phase of Patristic learning which was probably the most directly opposed to the scientific

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[49]Taylor, "The Medieval Mind," Vol. I, p. 76-7.
[50]Augustine, "Confessions," XII, 31.

point of view was the all-pervading belief in miracles and supernatural intervention. As Christianity itself was founded essentially upon a complex of alleged miraculous occurrences, it was but natural that the Christian Fathers should expect a continuance of these miraculous acts. To be sure, the pagan thinkers, particularly the Neoplatonists, had contended that divine action was essentially miraculous, but the Christians developed the lust for the miraculous much farther than the Neoplatonists. The miraculous was the surest proof of divine intervention in the interests of the faithful and to the embarrassment or discomfort of the Devil and his sinful followers. But the Devil himself was also prolific in miraculous acts, and it was often difficult for the good Christian of the Middle Ages to be certain whether God or the Devil had performed the miracle in question. Taylor has well summed this Patristic enthusiasm for miracle mongering:[51]

> Here are fundamental principles of patristic faith. The will of God is the one cause of all things. It is unsearchable. But we have been taught much regarding God's love and compassionateness, and of His desire to edify and save His people. These qualities prompt His actions towards them. Therefore we may expect His acts to evince edifying and saving purpose. All the narratives of Scripture are for our edification. How many mighty saving acts do they record, from the Creation, onward through the story of Israel, to the birth and resurrection of Christ! And surely God still cares for His people. Nor is there any reason to suppose that He has ceased to edify and save them through signs and wonders. Shall we not still look for miracles from His grace?
>
> Thus in the nature of Christianity, as a miraculously founded and revealed religion, lay the ground for expecting miracles, or, at least, for not deeming them unlikely to occur. And to the same result from all sides conspired the influences which had been obscuring natural knowledge. We have followed those influences in pagan circles from Plato on through Neo-Platonism and other systems current in the first centuries of the Christian era. We have seen them obliterate rational conceptions of nature's processes and destroy the interest that impels to unbiassed investigation. The character and exigencies of the Faith intensified the operation of like tendencies among Christians. Their eyes were lifted from the earth. They were not concerned with its transitory things, soon to be consumed. Their hope was fixed in the assurance of their Faith; their minds were set upon its confirmation. They and their Faith seemed to have no use for a knowledge of earth's phenomena save as bearing illustrative or confirmatory testimony to the truth of Scripture. Moreover, the militant exigencies of their situation made them set excessive store on the miraculous foundation and continuing confirmation of their religion.

This absorption in the expectancy and contemplation of the miraculous also reflected the Christian idea of God and the mode of his manifestation in nature. Since the days of the Deists we have come to conceive of God as manifesting himself, if he does so at all, in the orderly workings of nature.[52]

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[51]Taylor, "Medieval Mind," Vol. I, p. 74-5.

[52]A. C. McGiffert, "Protestant Thought since Kant," Chap. X.

Natural law and divine law have been assimilated, and no one of a scientific turn of mind expects or wishes any deviation from the norm of nature. But in the Patristic period God was expected to express himself primarily through aberrations and eccentricities in nature—the great prototype of which was the stopping of the sun in the interest of Joshua's military strategy. This Christian conception of God has been called by Harnack the belief in the "God of arbitrariness." Professor Robinson has well described this conventional Patristic attitude towards God:[53]

> The medieval Christian was essentially more polytheistic than his pagan predecessors, for he pictured hierarchies of good and evil spirits who were ever aiding him to reach heaven or seducing him into the paths of sin and error. Miracles were of common occurrence and might be attributed either to God or the devil; the direct intervention of both good and evil spirits played a conspicuous part in the explanation of daily acts and motives.
>
> As a distinguished church historian has said, the God of the Middle Ages was a God of arbitrariness—the more arbitrary the more Godlike. By frequent interferences with the regular course of events he made his existence clear, reassured his children of his continued solicitude, and frustrated the plots of the Evil One. Not until the eighteenth century did any considerable number of thinkers revolt against this conception of the Deity and come to worship a God of orderliness who abode by his own laws.

Closely related to the Patristic and medieval conception of the "God of arbitrariness" was the parallel view of the imminence and ubiquity of the Devil. Indeed, the activities of man and nature both were held to be but the resultant of the ever varying pressure of forces exerted either by God or the Devil. This was the whole basis of psychic causation in medieval psychology. M. Réville has well stated this paralyzing medieval belief in the omnipresence, activity and ingenuity of the Devil:[54]

> The absorbing nature of the belief in the devil during the middle ages is the point we wish to make clear. Those who have still this faith can hardly imagine to what a degree it then controlled men's whole lives. It was the one fixed idea with every one. A fixed idea tends, among those whom it possesses, to center everything in itself. When, at the present day, we observe closely those of our contemporaries who devote themselves to spiritualism, it is surprising to see how fertile their imagination becomes when they are busy in interpreting, in favour of their hobby, the most trifling and unimportant circumstances. The unlatching of a half-closed door, an insect describing arabesques in its flight, the fall of a badly-balanced article, the creaking of furniture at night-time, any of these petty accidents suffices to give wing to their fancy. If we generalize such a mental state, by substituting faith in the incessant interventions of the devil for the harmless illusions of our spiritualists, we shall get a fair notion of what took place in the middle ages.

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[53]Robinson, "Mind in the Making," p. 124-5.
[54]A. Réville, "The Devil, His Origin, Greatness and Decadence," p. 37-8.

6. The Repression of Heresy and the Machinery for Enforcing Acquiescence in Authority and Crushing Independent Thought—With the growth of Christianity there inevitably developed many different notions as to the nature of Christianity. There were widely divergent beliefs as to the nature of Christ, the purpose of his ministry, and the character and results of the Christian life. It soon became evident to the leaders of the Christian cult that some method must be found for checking this diversity or Christianity would be split into many irreconcilable sects and would perish from internal divisions in the face of imperial persecution and the competition of contemporary religions. By the middle of the second century we find the writers of Jude and Second Peter denouncing the heretics in exceedingly intemperate language, and a century later St. Cyprian set forth his famous dogma that outside of the one Catholic Church there was no salvation for any one, be his moral life as pure as that of St. Anthony and his impurity complex as highly developed as that of Anthony Comstock.[55] Within another century the Church had won over the Roman Empire to its side, and it was not long before imperial legislation in the Theodosian Code of 438 was directed towards enforcing obedience and conformity to accepted Christian doctrine. A man might suffer death if he failed to accept the view of the Trinity expounded by Damasus of Rome or Peter of Alexandria.[56] Heresy remained a capital crime for some twelve hundred years. As Christian dogma and the Christian Epic were almost wholly anti-scientific, and as deviation from this accepted body of knowledge was as hazardous as it was unlikely, it can readily be seen that science had little opportunity to exist, had other circumstances been favorable. It was not long after Cyprian until it was veritably true that "reason was in prison." Professor Robinson has admirably described this Christian intolerance and the psychological and historical basis from which it developed:[57]

> The Christian Epic did not have to rely for its perpetuation either on its intellectual plausibility or its traditional authority. During the Middle Ages there developed a vast and powerful religious State, the medieval Church, the real successor, as Hobbes pointed out, to the Roman Empire; and the Church with all its resources, including its control over "the secular arm" of kings and princes, was ready to defend the Christian beliefs against question and revision. To doubt the teachings of the Church was the supreme crime; it was treason against God himself, in comparison with which—to judge from medieval experts on heresy—murder was a minor offense.

[55]See Robinson, "Readings in European History," Vol. I, p. 19-21.
[56]*Ibid.*, p. 21-7.
[57]Robinson, "Mind in the Making," p. 131-3.

We do not, however, inherit our present disposition to intolerance solely from the Middle Ages. As animals and children and savages, we are naïvely and unquestioningly intolerant. All divergence from the customary is suspicious and repugnant. It seems perverse, and readily suggests evil intentions. Indeed, so natural and spontaneous is intolerance that the question of freedom of speech and writing scarcely became a real issue before the seventeenth century. We have seen that some of the Greek thinkers were banished, or even executed, for their new ideas. The Roman officials, as well as the populace, pestered the early Christians, not so much for the substance of their views, as because they were puritanical, refused the routine reverence to the gods, and prophesied the downfall of the State.

But with the firm establishment of Christianity edicts began to be issued by the Roman emperors making orthodox Christian belief the test of good citizenship. One who disagreed with the emperor and his religious advisers in regard to the relation of the three members of the Trinity was subject to prosecution. Heretical books were burned, the houses of heretics destroyed. So, organized medieval religious intolerance was, like so many other things, a heritage of the later Roman Empire, and was duly sanctioned in both the Theodosian and Justinian Codes. It was, however, with the Inquisition, beginning in the thirteenth century, that the intolerance of the Middle Ages reached its most perfect organization.

Heresy was looked upon as a contagious disease that must be checked at all costs. It did not matter that the heretic usually led a conspicuously blameless life, that he was arduous, did not swear, was emaciated with fasting and refused to participate in the vain recreations of his fellows. He was, indeed, overserious and took his religion too hard. This offensive parading as an angel of light was explained as the devil's camouflage. No one tried to find out what the heretic really thought or what were the merits of his divergent beliefs. Because he insisted on expressing his conception of God in slightly unfamiliar terms, the heretic was often branded as an atheist, just as to-day the Socialist is so often accused of being opposed to all government, when the real objection to him is that he believes in too much government. It was sufficient to classify a suspected heretic as an Albigensian, or Waldensian, or a member of some other heretical sect. There was no use in his trying to explain or justify; it was enough that he diverged.

7. Necessity of an Alteration of Intellectual Attitudes and Interests before a Scientific Revival Could be Possible—The above brief enumeration of the chief phases of pagan and Christian culture, which either discouraged or opposed the scientific point of view, should at least be sufficient to prove that, far from there being no evident reasons for the decline of Hellenistic scientific activity, the real truth is that there was almost every possible cultural reason for the extinction of scientific activity in the early Middle Ages. Before any promising revival of science could be expected it was necessary, as Professor Robinson insists, that there be a fundamental revolution in intellectual attitudes and interests:[58]

In order that modern science might develop it is clear that a wholly new and opposed set of fundamental convictions had to be substituted

[58] *Ibid.*, p. 144-5.

for those of the Middle Ages. Man had to cultivate another kind of self-importance and a new and more profound humility. He had to come to believe in his capacity to discover important truth through thoughtful examination of things about him, and he had to recognize, on the other hand, that the world did not seem to be made for him, but that humanity was apparently a curious incident in the universe, and its career a recent episode in cosmic history. He had to acquire a taste for the simplest possible and most thoroughgoing explanation of things. His whole mood had to change and impel him to reduce everything so far as possible to the commonplace.

The process of the dissolution of the Christian Epic and the Patristic tradition was a gradual one to which many forces contributed. In the later Middle Ages there developed an interest in observing the commonplace things of nature, noticeable in the work of Albertus Magnus, Adelard of Bath and Roger Bacon. Bacon also risked at least a mild assault upon the metaphysical scholastic method and upon the régime of authority. The Humanists revived an interest in the secular matters which had attracted the pagan past. Copernicus, Tycho Brahe, Galileo, Kepler and Newton initiated the modern scientific movement by their notable discoveries in the field of astronomy and mechanics. Bruno, Bacon, Descartes and the later Rationalists set forth the philosophic implications of the progress of natural science, as exemplified by the work of Copernicus and his successors. The period of oversea expansion brought in a vast mass of new scientific data and did much to break down the rigidity of the medieval intellectual attitudes and to dissipate the European provincialism of the Middle Ages. Finally, Voltaire and Tom Paine launched a comprehensive attack upon the whole Christian Epic, and Diderot for the first time popularized the new learning. The rule of Augustine and the spell of the Patristic obsession had at last been challenged, if not broken.

IV. Economic, Social and Political Conditions in the Later Roman Empire Which Discouraged Scientific Activity

While science may flourish under adverse conditions in the economic, social and political environment to better advantage than under obstacles in the intellectual environment, it is fostered by conditions of peace, prosperity, order and social flexibility. None of these existed in the society of the later Roman Empire and the Early Middle Ages. Economic conditions became progressively worse. Depending largely upon Gaul and the Orient for its sustenance, Rome developed the psychology and practices of the spendthrift

and the parasite. Senseless waste characterized the upper classes and publicly engendered pauperism the proletariat. The provinces were ravaged by administrative grafters, and the sources of imperial revenue were slowly but surely exhausted before the time when they were most needed at the time of Diocletian. The cities became less prosperous and populous, the social basis of Roman imperial civilization slowly shifted back to an agrarian order, in which landownership by great landlords replaced the earlier agricultural era of peasant freeholding. Poverty increased and the cost of living went up, in spite of efforts at government control. The middle class—the backbone of Roman society—were crushed by the burden of taxation which fell upon them with an unjust incidence, and they gradually slipped down into a condition in which they merged with the peasantry in a semi-servile class—the *colonate*.[59] The Roman world became a feudal régime, lacking only the military element, which was to be supplied by Charles Martel and the early Carolingians. In the later Roman Empire there came a great centralization of governmental powers and an increase of political functions, but it was at a time when it was least easy to raise the revenue necessary to support the newly acquired burdens of administration and when the administrators could be most readily ignored by the powerful group of arrogant and plutocratic landlords, who were laying the basis for what was to be the economic, social and political system which prevailed in Europe for a millennium. Anarchy, confusion and disorder grew apace and were powerfully forwarded by the barbarian permeation.[60] Not until the ninth century were conditions even partially stabilized, and the twelfth century marks the first emergence of an era which, in economic, social and political conditions, was even moderately adapted to forming the environment out of which might develop the preliminary stages of a revival of scientific interest and achievement. Mr. Dill, in his remarkable account of the decline of Roman society, presents the following graphic picture of the economic, social and political disintegration of Roman society which accompanied the decadence of pagan learning and the rise of the Christian Epic:[61]

We have hitherto been occupied with the condition of Roman society in the West as it is revealed to us in its literary remains. But Symmachus,

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[59]W. L. Westermann, "The Economic Basis of the Decline of Ancient Culture," in *American Historical Review*, July, 1915.

[60]S. Dill, "Roman Society in the Last Century of the Western Empire," Books III-IV.

[61]*Ibid.*, p. 227-9.

Ausonius, Sidonius and their class throw little light on the condition of other classes than their own, or on the deep-seated and inveterate diseases which for generations had been undermining the strength of the imperial system. The general tendency of modern inquiry has been to discover in the fall of that august and magnificent organization, not a cataclysm, precipitated by the impact of barbarous forces, but a process slowly prepared and evolved by internal and economic causes. It is probable that the barbarian invasions of the fifth century were not more formidable than those of the third, which were triumphantly repelled by the Illyrian Caesars, or than those of the fourth, which were rolled back by the genius of Julian and the ferocious energy of Valentinian. The question why the invasions of the fifth century succeeded, while the earlier failed, is best answered by an appeal to the Imperial Code. In the voluminous enactments issued from Constantine to Majorian, the student has before him a melancholy diagnosis of the maladies which, by a slow and inevitable process of decay, were exhausting the strength of Roman society. He will see municipal liberty and self-government dying out, the upper class cut off from the masses by sharp distinctions of wealth and privilege, yet forbidden to bear arms, and deprived of all practical interest in public affairs. He will find that not only has an Oriental monarchy taken the place of the principate of Augustus, but that an almost Oriental system of caste has made every social grade and every occupation practically hereditary, from the senator to the waterman on the Tiber, or the sentinel at a frontier post; and that human nature is having its revenge in wholesale flight from a cruel servitude and the chaos of administration. It will be seen that in a society in which poverty is almost branded with infamy, poverty is steadily increasing and wealth becoming more insolent and aggressive; that the disinherited, in the face of an omnipotent government, are carrying brigandage even up to the gates of Rome; that parents are selling their children into slavery; that public buildings are falling into decay; that the service on the great post roads is becoming disorganized. At a time when every frontier was threatened, it will be found that the frontier posts are being abandoned, that there is wholesale desertion from the ranks of the army; while in the failure of free recruits, the slaves have to be called to arms. But the unscientific and inefficient financial system will chiefly attract the notice of the historical inquirer. The collection of imposts in kind opened the door to every species of corruption. Still more fatal to pure administration was the system which left to the municipal class the assessment and collection of the revenue in their district. That doomed order are at once branded as the worst oppressors, and invested with the melancholy glory of being the martyrs of a ruinous system of finance. Their lingering fate, recorded in 192 edicts, a tragedy prolonged through more than five generations, is one of the most curious examples of obstinate and purblind legislation, contending hopelessly with inexorable laws of society and human nature. In that contest the middle or bourgeois class was almost extinguished, Roman financial administration was paralyzed, and at its close the real victors and survivors were the great landholders, surrounded by their serfs and dependents. A volume might be written on the corruption and cruel oppression of the officials of the treasury, servile to the great, tyrannical to the poor, and calmly defying all the menaces of the emperor in their unchecked career of rapacity. The last and deepest impression which the inquirer will carry with him, as he rises from a study of the Theodosian Code, is that fraud and greed are everywhere triumphant, that the rich are growing richer and more powerful, while the poor are becoming poorer and more helpless, and that the imperial government, inspired with the best intentions, has lost all control of the vast machine.

It must be remembered, however, that these adverse economic, social and political conditions did not initiate the beginnings of the decline of ancient science. This had started before the passing of the most peaceful and prosperous days of the Roman Empire. Rather, these conditions in the social environment simply helped along the process during the Patristic and early medieval periods, but they were too significant in the era of their influence to be ignored.

PSYCHOANALYSIS OF FREUD AND ADLER
OR
SEX-DETERMINISM AND CHARACTER-FORMATION[1]

By Francis Cecil Sumner

I

The question of sex-determinism is both biological and psychological. The psychological aspect of the problem is of very great import for our knowledge of the variance in human character-type. As finger-prints of not two individuals are exactly alike according to Bertillon, so also not two individuals are completely alike in character or diathesis. This infinity of individual differences signifies that according to the bisexual theory of Fliess (*Zwischenreich*), Halban (*pseudohermaphroditismus secondarius*), and Hirschfeld (*Zwischenstufentheorie*) there are no two individuals in whom the particular fusion of masculinity and femininity exists identical for each. Thus in a dynamic sense, character or diathesis is the particular fusion of masculinity and femininity within the particular individual.

Every individual is a duplex, i. e., both masculine and feminine:—a psychic if not a somatic pseudohermaphrodite. In each bisexual ensemble there is a dominant and a recessive sexuality. It is this dominant sexuality whether masculine or feminine which is more conspicuous in the individuality and which leads common parlance to speak of an individual as male or female, unmindful of the deeper complexity of human nature. That there is no absolute male or female but only approximations thereto involves the formation of a working hypothesis. Thus the relative sex-determinism within the individual character is a matter of the ratio of masculinity to femininity within such a one. This amounts to saying in the form of a law that in man the increase in masculinity is inversely proportional to the decrease in femininity and in woman the increase of femininity is inversely proportional to the decrease in masculinity.

These generalizations already set forth by Otto Weininger ("Sex and Character") lack merely the biological and psycho-

[1]A dissertation submitted to the faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of Dr. G. Stanley Hall.

logical support which shall herewith be presented. For sake of clearness this evidence may be divided into two categories: 1. The Phylogenetic; 2. The Ontogenetic.

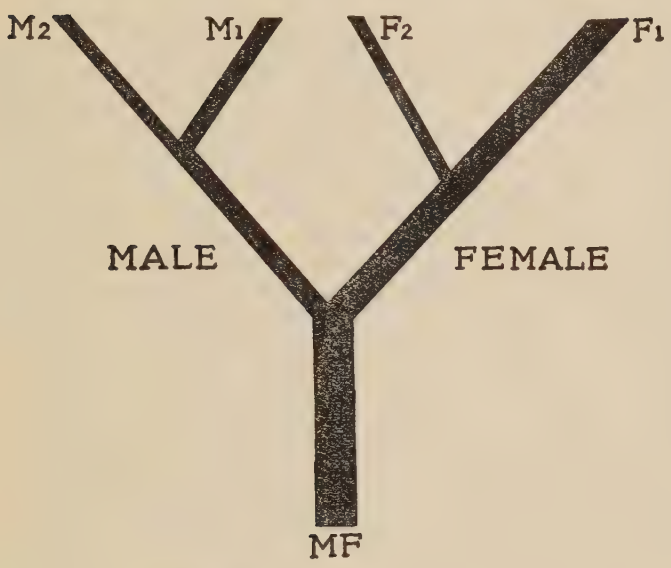
1. The Phylogenetic—When the principle of Mendelian inheritance is applied to the evolution of the two sexes the results are significant for the bisexual theory. The so-called male and female of the species have descended from a remote common ancestor in the micro-organic realm. According to Belfield this far off ancestor of the two sexes while hermaphroditic in the main, nevertheless bore more points of similarity to our so-called female than to our so-called male and for that reason he prefers to indicate femaleness as the dominant Mendelian character; maleness as the recessive Mendelian character. From this primitive common parent of the two sexes were evolved the two lines: one in the masculine direction and one in the feminine direction. The respective goals of these two evolving lines are conceived as approximations to absolute masculinity and absolute femininity. After the two sexes were evolved, i. e., after the division into male and female according to the primary sex-character, there recapitulated in each of the two sexes the evolutionary process which had gone on before in the evolution of the two sexes. The masculine line again differentiates itself into the more masculine as recessive line and into a more feminine as dominant line; the feminine line differentiates itself into the more masculine as recessive line and into a more feminine as dominant line. This secondary differentiation deals with secondary, tertiary, etc., sex-characters. A genealogical tree of the evolution of the sexes based on Mendelian inheritance might here serve to clear up the foregoing.

Thus far have evolved four great bisexual character-types:

1. The males in whom masculinity predominates (M_2).
2. The males in whom femininity predominates (M_1).
3. The females in whom masculinity predominates (F_2).
4. The females in whom femininity predominates (F_1).

It is proper here to insert some of the biological evidence for this genealogy of the sex-types. Belfield claims that as the unicellular organisms or protozoa are the most primitive ancestors of man so also their reproductive life is the evolutionary prototype of present-day reproductive life of the higher animals including man. He with Thomson, Geddes and others trace the reproductive life in the following three stages:

1. Asexual reproduction. At this stage hunger and reproduction, two of the most primitive instincts, were closely bound up in the one micro-organism; and here is found the



HERMAPHRODITIC COMMON ANCESTOR

primitive hermaphroditic *Anlage* of the two sexes, for not yet had two differently sexed organisms appeared and reproduction consisted of parthenogenesis, autofecundation, self-fertilization or cell-cleavage. Such a process is to be seen today in what remains over in certain varieties of shell-fish, female plant lice and in cell-cleavage itself.

2. Bisexual reproduction. Towards the dawn of the metazoa evolved the male-cell and the female-cell within the body of the hermaphroditic parent to be seen today in such extant remains as the earth-worm, the snail and the oyster. Thomson and Geddes assign two major biological reasons for the division into male and female germ-cells: the biological advantage of cross-fertilization; and the greater specialization of the female apparatus. Of this stage Belfield writes: "For in many animal-types there is no male; when he does appear, he is at first merely a parasite upon or within the body of the female."

3. Unisexual reproduction. This stage but continues the evolution of the two germinal sexes begun in the second stage. The male cell evolves in its direction and the female specializes in its direction. For reproduction is requisite the conjugation of male and female organisms.

The general directions of the two evolving lines are: one in the direction of absolute masculinity and the other in the direction of absolute femininity. Many students have arisen to point out the major sex-differences between the masculine and feminine lines of evolution. Among them are of especial note Ellis, Moebius, Bucura, Blair Bell, Heymann, Finot, Moll, Thomson and Geddes. Both Fouillee and Walter Heape compare the male individual to the spermatozoon and the female individual to the ovum. "The male is active and roaming; he hunts for his partner and is an expender of energy; the female is passive, sedentary and is a conservator of energy." Thomson and Geddes diagrammatically summarize the major biopsychic sex-differences thus:

Male	*Female*
Sperm-producer	Egg-producer
With less expensive reproduction	With much more expensive reproduction
More intense metabolism	Less intense metabolism
Relatively more katabolic	Relatively more anabolic
Often with shorter life	Often with longer life
Often more brilliantly colored and more decorative	Often quieter in color and plainer
Rising to more intense outbursts of energy	Capable of more patient endurance
More impetuous and experimental	More persistent and conservative
More divergent from youthful type	Nearer the youthful type
Often more variable	Often less variable
Making more of sex-gratification	Making more of the family
More combative	Consolidating the family

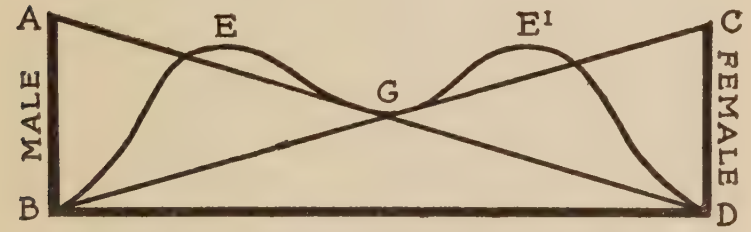
Moebius seeks mainly to indicate the skeletal differences between the sexes and incidentally to dwell upon the roving disposition (*Wanderlust*), aggressivity, of the male in contradistinction to the homing-instinct (*Heimtrieb*), maternal love, tender feeling, dance and music impulses of the female. Weininger refers to the male tendency as the "liberating impulse" while to the female tendency as the "uniting impulse." Adler refers to the male tendency as the aggressive will-to-power, superiority impulse, while to the female tendency as passivity, inferiority impulse. Freud speaks of the feminine tendency as the love impulse while Ellis goes so far as to say, "A man is a man to his very thumbs and a woman is a woman to her little toes." Bucura is not alone when he points out that the female is more emotional, more unconscious, more intuitive, more aesthetic, more infantile.

Suffice it to say that the two evolving lines are diametrically opposite in character or tend in that direction. In cross-fertilization, as is all human reproduction, the male line merges with the female line, i. e., in the germ-cell fusion a recapitula-

tion of the primitive hermaphroditic stage of unicellular organisms and the evolution of the new individual traverses the evolutionary stages of the remote development of the two sexes, the dominant sexuality gaining the ascendency. Not only do the primary sex-characters contend for the mastery but also the secondary, tertiary, etc., sex-characters autonomously do likewise. If the sex-determinant is merely the x-chromosome, there is indeed a great complexity underlying it the nature of which can be gleaned from the following complex study of ontogeny.

2. *The Ontogenetic*—Not only does the Mendelian principle when applied to the phylogeny of the sexes indicate the common ancestry of the two sexes, but also it goes far in explaining the presence of heterologous secondary, tertiary sex-characters in hermaphrodites proper and ordinary human beings or pseudohermaphrodites. The study of hermaphrodites proper reveals in bold relief the presence of heterologous sex-characters in combination. Likewise it reveals the similarity of every individual to a hermaphrodite in that an individual is neither completely male nor completely female but rather a combination of the two with one more dominant than the other. Thus in technical language every individual is a bisexual, i. e., a pseudohermaphrodite if not a hermaphrodite proper.

The following chart may illustrate the ratio of maleness to femaleness and the relation of distribution of hermaphrodites proper to pseudohermaphrodites:



in which the triangle *ABD* equals masculinity and the triangle *BCD* femininity. The overlapping of the two triangles represents at each point, whether moving toward the right or toward the left, the relatively normal ratio of bisexuality in any particular individual. Within the lines *AB* and *CD* are included hypothetically all human beings. To the left, masculine individuals or individualities predominate; and to the right, feminine individuals or individualities predominate.

Thus the numerical distribution of individuals may be indicated by the camel-humped curve $BEGE^1D$. In the region of G are hermaphrodites proper; in the regions of the humps E and E^1 are the bisexual monosexuals male and female respectively. In other words the dip in the curve between the two humps represents the true hermaphroditic bridge between the two so-called monosexuals. This bridge is the true atavistic regression to the primitive hermaphroditic common parent. Within each so-called monosexual group persists the evolutionary struggle between male and female characters. Thus each individual, whether male or female as to the primary nature of the gonads, is secondarily bisexual or pseudohermaphroditic.

Here it is again fitting to insert biological and psychological evidence in support of the above-mentioned considerations. Krafft-Ebing, renowned sex-psychopathologist, writes: "The original bisexuality of the ancestors of the race, shown in the rudimentary organs of the male, could not fail to occasion functional if not organic reversions, when mental or physical manifestations were interfered with by disease or congenital defect." Elsewhere: "The individual being must pass also thru these grades of evolution. The psychophysical sexual difference runs parallel with the high level of the evolving process. The individual being must also itself pass thru these grades of evolution; it is originally bisexual but in the struggle between the male and female elements either one or the other is conquered and a monosexual being is evolved which corresponds with the type of the present stage of evolution, but traces of the conquered sexuality remain." It is interesting to find a great physiologist, A. Biedl, maintaining a similar viewpoint: "The secondary sexual characters develop in a masculine or feminine direction, according as to whether the masculine or feminine internal secretory glands predominate. The occurrence of heterologous secretory sexual characters is explained by the supposition that the internal secretory portion of the sexual glands that belongs to the other sex obtains the upper hand."

The recent discovery of and extended research in the internal or endocrinal glands have given a new impulse to the study of the relation they bear in sex-determination. There are numerous glands in the organism which have a two-fold function: their autonomous biological mission and their subservient co-operative mission to the primary sex-character—the gonads. For example, the mammillary gland which beside its proper functioning of lactation bears also the closely interrelated rôle to the ovaries. The stimulation of the mammil-

lary glands not only stimulates them in growth and secretion but also stimulates ovarian secretion. The pituitary body or gland controls obesity and in females is closely interrelated with the gonads. So with the other endocrinal glands which underlie the several biological structures and functions of the organism the exact rôle of which is being investigated. Hermaphrodites offer the best field for the study of endocrinal activity. In hermaphrodites the activity of the internal glands is exaggerated or else heterosexual in a very conspicuous manner.

Blair Bell ("The Sex Complex") and Bucura ("Die Geschlechtsunterschiede beim Menschen") have gained particular prominence owing to their experimental studies of the functioning of the thymus, thyroid, parathyroid, hypophyseal, mammillary, pineal, suprarenal, pituitary glands in the postnatal sex-determination, especially as to psychic and somatic sex-characters. Blair Bell verifies his histological findings by the study of hermaphrodites. In the bisexual monosexual of today the functioning of a number of the internal glands may be that of the opposite sex, leading to the complexity of the general psychic character of the individual.

As recently as 1918 Miss Mary O'Malley, clinical director of St. Elizabeth's Hospital, Washington, D. C., in an interesting and significant paper indicates the possibility of a symptomatology of such pathological polyglandular syndromes. Thus according to her investigation there are five major symptoms:

1. A deviation of the anatomical configuration of the body, including to a degree faulty skeletal development. Under this symptom is classified the masculine or feminine character of the outline of the body, the pelvis, the larynx, the features, the shape of the hands and the feet. Quite an importance attaches to the conformation of the hand as whether feminine ("type en long," acromegaly) or masculine ("type en large," gigantism).

2. Adiposity or fatness. The presence of fatness—a feminine character—is symptomatic of heterosexual internal secretion in the male while leanness, a masculine trait, is symptomatic of heterosexual internal secretion in the female.

3. A disturbance of the pilous system. Here is classified the masculine or feminine character of the hair as whether strong and coarse or light down, soft and nearly invisible; of the beard, the mustache, the hypertrichosis of the body, especially the stomach and chest. Thus the presence of a light beard or mustache in the female is indicative of underlying masculine endocrinal functioning while the absence of beard

or mustache in the male is indicative of underlying feminine endocrinal activity. The etiology of hirsutism involves, besides the hyperfunctioning of the gonads, the anomalous functioning of other endocrinal glands.

4. Disturbances of the genital function, such as of menstruation, and of the secondary sex-characters which resemble those of the opposite sex. Such disturbance of menstruation may include precocious menstruation, irregularities of menstruation, delay in the establishment of the menses, arrest of menstruation extending over long intervals. Here may be included anomalies of the external genitalia which shall be spoken of shortly and the alteration of the sexual bivalency from prepubertal masculinity or femininity to post-pubertal femininity or masculinity.

5. Disturbance of the psychosexual development—psychic hermaphroditism which is manifested in the peculiar contrary sexual inclination to femininity and to masculinity or to heterosexuality and homosexuality. "The psychical anomalies are displayed in the behavior of the individuals and in the content of their mentally disordered thought and dissociation of ideas which is the expression of their unconscious strivings."

The study of the comparative morphology of the two sexes points to the possibility of additional complexity as regards the maleness and femaleness of certain structures in the bisexual organism. Belfield illustrates this point in regard to the variations in morphology of the larynx. The male relatively differs an octave from the female as to the pitch of the voice in proportion to the greater length of the laryngeal cords. Feminine laryngeal cords differ only slightly from those of children in length. Hence the larger in appearance the so-called Adam's apple the more masculine the voice, provided the vocal cords are equally taut. However, masculine voices are frequently found among masculine women. Again Belfield points to the descendency of the male from a quasi-feminine or hermaphroditic common primitive ancestor of the two sexes as evidenced in the feminine rudimentary organs in man such as the supernumerary teats or as the normal male teats. Relatively the osseous and muscular structure of man varies from that of woman in accordance with the greater struggle for existence which man has had to face. This is also the case with head, skin and hair. Through phyletic use and disuse we have seen the pelvis relatively larger in the female than in the male. These characters are by no means absolutely transmitted through sex-linked

inheritance, for in the bisexual we see the heterologous inheritance of these very characters. The male may have soft skin and the female tough skin; the male may have a small head or a soft downy hair or large pelvic region or large buttocks and the female the contrary.

Thus far we have seen the complexity of secondary and tertiary sex-characters in the character-complex. This complexity pushes even over into the sphere of the primary sex-character—the genital organs. Here as elsewhere the true hermaphrodite offers a splendid field for study. From such a study can be brought out in relief what exists in the bisexual monosexual in less clearly defined lines. Ernst Haeckel thus in his "Evolution of Man" points to the analogous relation between the female and male genitalia and suggests the probable hermaphroditic source. Accordingly the female clitoris is analogous to the male penis; the labia minora and majora to walls of the male scrotum; the vulvar cleavage to the suture in the male extending from near the anus over the scrotum up the dorsal side of the penis to the glans; the ovaries to the testes. In the baby boy the testes are up in the body and only fall down into the pockets of the scrotum sometime after birth. In hermaphrodites these characters of the genitalia above-mentioned are inherited in the disordered heterosexual fashion which called forth the name. In bisexual monosexuals these genital characters are also heterologous. Maeder points out two great types of woman, the masculine clitoris-type and the feminine womb-type, owing to the variation in the above-mentioned regards. The masculine or clitoris type is tomboyish, enjoying sports and making more of sex-gratification than the womb-type, who is passive and whose pleasure is in the fruit of the womb.

Blair Bell has pushed his experimental study even over into the ovarian and testicular glands and finds so far that the secretion of these glands varies for different individuals. The greater the secretion of these analogous organs the nearer masculine the individual, whether male or female. Thus he points to women of hyper-secretive ovaries as incapable of even moral restraint.

From the hermaphroditic standpoint the male is an ensemble of masculine and feminine characters, as likewise the female. The dominant masculinity or femininity in the bisexual ensemble determines the dominant psychic tendency of the individual either toward femininity or toward masculinity. This very point was of supreme importance to Adler ("Der psychische Hermaphroditismus im Leben und in

der Neurose"). For him the most sickly diathesis, physical or psychical, is that one which lies in the middle ground between pure femininity and pure masculinity. Such a diathesis is an hermaphroditic one, that is, a vestige of the primitive hermaphroditic existence. Such an individual, like any vestigial organ, is subject on the physical side to weakness, corpulence, sickliness, awkward behavior, infantile ailments as enuresis, incontinentia alvi, flatulence, stuttering, short-windedness, vertigo, insufficiences of the visual and auditory apparatus, congenital or early acquired deformities, striking ugliness, etc.; on the psychic side to timidity, psychic instability, dual personality, compulsion-neuroses and other extremely neurotic phenomena. If the individual is congenitally equipped with a predominance of masculinity, a compensatory-process is set up to atone for insufficiencies or inferiorities. This masculine protest or compensatory-process is variously described as "unchecked aggression, activity, power, courage, freedom, compulsion-neuroses, wealth-striving, attack, sadism, authority." On the other hand, if the individual is congenitally equipped with a predominance of femininity, a compensatory-process is set up towards femininity, a feminine protest towards submission, love, passivity, masochism, obedience and compassion. Although the dominant tendency, whether masculine or feminine, asserts itself conspicuously, yet there reside in the character-complex latent remnants of the conquered tendencies which also occasionally assert themselves. This latter phenomenon is noticed pronouncedly in the study of eunuchs. Castration in the male appears to give the ascendency to hitherto latent feminine tendencies. Steinach of Vienna in his "Regeneration" gives some results of his experimental study of vasectomy in the male which indicates that feminine tendencies assert themselves. Likewise ovariotomy or oophorectomy in the female gives the ascendency to hitherto latent masculine tendencies.

The vast field of homosexuality studied by Krafft-Ebing, Hirschfeld, Ellis and Moll more commonly furnishes examples of heterologous feminine and masculine tendencies within the bisexual monosexual. Such extreme psychosexual perversions are, to be sure, wholly within the field of morbid pathology. The same considerations, limited, however, to normal individuals, reveal a struggling of sex-characters for masculine or feminine ascendency. Individuals falling within the domain of normality, however, are those possessed with heterosexual as opposed to homosexual inclinations.

II

The foregoing exposition has proven itself profitable if only the significance of its content for character-formation is gleaned. Character from the standpoint of psychodynamics has particular reference to those instinctive and emotional urges which constitute the very dynamo of a living organism. They not only condition all our responses, i. e., our activity, but, what is more, the very thoughts we shall think.

What then are those instinctive and emotional urges? Reduced to primordials, they are reproduction and hunger—primitively one. The reproductive instinct involves with the evolution of the two sexes the masculine urge and the feminine urge. The masculine urge is the will-to-power, to fight, to subdue, to make the most of self, the will to be a man; and its accompanying emotions are hate, anger, revenge, jealousy and envy. The feminine urge, on the other hand, is love, spiritual love, maternal love, passivity, submission and compassion, the will to be a complete woman. Both urges spring out of the respective rôles in the reproductive act. Federn, in particular, attributes the energy-source, as well of all sadistic behavior as of all masochistic behavior, to a libidinous one. In this matter Federn is not by himself, for Sadger and Eulenberg, special students of sadism and masochism, make the same claim. Sadism is the inclination to inflict pain to the beloved by beating, overcoming, torture and other means and is a masculine urge. On the other hand, masochism is the inclination to suffer pain from the beloved and is a feminine urge. These urges which find their primary importance in the reproductive act also find themselves very frequently sublimated into activities and emotions somewhat removed from the primary function: sadism into conquest of wild beasts, of nature and of other men, aggressivity in general, love of self, self-maximation, revenge, will-to-power; masochism into love of children, of home life, social life and spiritual love and philanthropy, not to say anything of neurotic love-fixations and neurotic anxieties from unsatisfied love-propensities.

The dynamic character of the individual is thus dependent upon the dominance of masculine or feminine constituents within the individual. Thus along the gamut of bisexual diatheses ranging from approximately absolute femininity to approximately absolute masculinity there may be grouped four general character-types, i. e., two subtypes under the male line and two subtypes under the female line. Thus follows a scheme of the four types with lists of comparative psychic characteristics:

MALE LINE		FEMALE LINE	
No. 1 female-MALE	No. 2 FEMALE-male	No. 3 MALE-female	No. 4 male-FEMALE
Sadistic	Masochistic	Sadistic	Masochistic
Aggressive	More passive	Aggressive	More passive
Will-to-power	Will-to-love	Will-to-power	Will-to-love
Hate	Love	Hate	Love
Ambitious to attain a goal	Paterfamilias—goal of ambition	Ambitious to attain a goal	Family—goal of ambition
Considers woman inferior — enemy of woman save as means to sex-gratification	Lauds woman	Considers woman inferior—enemy of woman rôle save as means to sex-gratification	Lauds woman-rôle
Differentiates self from woman	Would like to be a woman	Differentiates self from woman	Would like to be perfect woman-mother
Superior in intellect	Inferior intellect	Superior intellect	Inferior intellect
Rational	Intuitive	Rational	Intuitive
More conscious	More unconscious	More conscious	More unconscious
Removed from youthful type	Nearer youthful type	Removed from youthful type	Nearer youthful type
Revengeful	Forgiving	Revengeful	Forgiving
Jealous	Not jealous	Jealous	Not jealous
Malevolent	Benevolent	Malevolent	Benevolent
Envious	Charitable	Envious	Charitable
Cruel	Compassionate	Cruel	Compassionate
Egoistic	Social	Egoistic	Social
Misanthropic	Philanthropic	Misanthropic	Philanthropic
Ungrateful	Grateful	Ungrateful	Grateful
Discourteous	Courteous	Discourteous	Courteous
Vain	Modest	Vain	Modest
Courageous	Fearful	Courageous	Fearful
Selfish	Generous	Selfish	Generous
Impenitent	Penitent	Impenitent	Penitent

The character-traits enumerated above are peculiar to the more masculine of the male and female lines; and to the more feminine of the male and female lines. Thus underlying the psychological and moral character-traits of any individual are biological characters predisposing the individual to masculine or feminine tendencies.

The four great psychological character-types above indicated correspond exactly to the four great biological character-

types of bisexual humanity an account of which latter was given in Chapter I.

No. 1	No. 2	No. 3	No. 4
M_2	M_1	F_2	F_1

For reasons to be seen in the following chapter, it is preferable to call these character-types thus:

No. 1	No. 2	No. 3	No. 4
Adlerian Male	Freudian Male	Adlerian Female	Freudian Female

after Adler and Freud, the two great founders of psychoanalysis whose doctrines of the neuroses open to us such a profound insight into the very psychological nature of these great character-types.

III

Question arises whether or not it would prove remunerative to throw the searchlight of psychoanalysis upon the lives of its very founders. Such an exploration, to be sure, would reveal a wealth of insight as regards the seemingly irreconcilable antagonism which exists between Freud and Adler. More than this, it would contribute a much needed correlation between their respective theories. In evidence of the above, the following considerations may lend some meager suggestions:

Freud himself makes public in his "History of the Psychoanalytic Movement" the irreconcilable antagonism which existed between Adler and himself, which in 1911 culminated in the former's actual withdrawal from the Freudian school and in the founding of a new school of his own. This last resort was reached only after much bitter personal antipathy, an example of which is immediately evidenced in the embarrassing terms with which Adler once in the presence of the Psychoanalytic Society addressed Freud: "Do you believe it is such a great pleasure for me to stand in your shadow all my life?" From the inferior position of Freud's pupil, Adler independently arose to the commanding position of his hated rival.

The fundamental nature of this seemingly irreconcilable "scientific antagonism" lay in the personal psychic nature of the two men, whom we may excellently study in their respective exteriorizations, i. e., in their respective doctrines of the neuroses.

As a result of a long and painstaking clinical experimentation with psychotics and neurotics, Freud formulated his far-famed theory of the etiology and therapy of the psychoneuroses. It must not be hastily assumed that Freud, in formulating his remarkable theory, ignored the labors of his

predecessors in this field in whose work he had been schooled. He himself gives due credit to his masters, Breuer, Liebault, Bernheim and Charcot. It was upon the immediate instigation of Breuer, Chrobak and Charcot that Freud sought a deeper insight into the origin of the neuroses. He had early sensed the unusual stress these men laid upon the *vita sexualis* in the etiology of disorders not to be explained by the old physico-chemico-anatomical diagnosis.

This strange sort of etiology was readily seized upon by Freud and investigated, with the result that he has given the world a well-shaped doctrine of the neuroses—one which is essentially based upon the sex-instinct and the inhibition of its function. It is very important for a comprehensive grasp of the Freudian viewpoint that one understand the significance both of sex-instinct and of its inhibition.

1. Sex-instinct from the standpoint of the Freudian psychology is essentially comparable to the more philosophical vital urge labeled by Schopenhauer "the will-to-live" or by Bergson "élan vital." By Freud, however, it is considered more from a psychological aspect as the basal instinct of life, the vital creative dynamic which is working its way upward through organic matter, speaking in Bergsonian language. At once it looms much larger and more inclusive than the sex-instinct of common parlance. It comprehends hunger and sex as primarily identical and would embrace still other instinctive impulses and their accompanying emotions as partial impulses (*Partialtriebe*) which have become specialized and seemingly dissociated from the original sex impulse through psychic evolution. Let us quote Freud in this regard.[2] "We reckon to the sexual life also all activities of tender feelings which have proceeded out of the spring of primitive sexual emotions, even if these emotions have experienced an inhibition of their originally sexual aim or have exchanged this aim for another less sexual. We use the word sexuality in the same inclusive sense as the German language uses the word *lieben*."

It is thus that Freud sees fit to give to his sex-instinct, conceived as one big, imperative, creative, organic sex-wish, the more semi-vitalistic designation of "libido." As von Hartmann conceived Schopenhauer's will-to-live as unconscious, so Freud conceives his libido as unconscious; and in addition it is governed solely by the pleasure-pain principle.

2. The greatest obstacle to the joyful fruition of the libido is the cultural repression, chiefly moral, imposed from

[2] "Ueber 'wilde' Psychoanalyse." 1911.

without. Thus, for Freud, consciousness, whose supreme task is to adjust the individual to the social milieu, acts as the psychic agent of repression and is called by him the reality-principle (*Realitatsprinzip*). Here one sees an analogous relation between Bergson's creative *élan vital* pushing its way up through resisting matter in the organic realm and Freud's libido pushing up its way through the psychic hindrances imposed by consciousness in the psychic realm. The impediments to the libido summed up in repression do not annihilate it but cause the mental disturbances grouped under the genus psychoneuroses as hysteria, anxiety-neuroses and so forth.

Many psychic mechanisms have been improvised by the unconscious libido in order to overcome in its struggle with the inhibiting effects of consciousness, some few of which may be tabbed off as follows:

1. Sublimation—a process by means of which the repressed libido escapes the endopsychic censor of consciousness in the noble guise of a more refined impulse as spiritual love.
2. Transposition of feeling, or ambivalency of emotions, where one emotion is transformed into its opposite, as especially love into hate.
3. Dreams, day-reveries, slips of the pen and tongue, unconscious word associations, infantilism, hysteria, symbolism, mysticism, religion, hypnotism, myth and the comic, all represent various channels of escape for the libido.

The subconscious libido, according to Freud, has its own thought-life in many respects akin to Bergson's intuition, the affective thought and memory of Ribot, the Herbartian apperception, the autistic thinking of Bleuler. Ideas sensory and conscious in origin have infiltrated to the unconscious realm here somewhat akin to memory and are associated according to their affective value or libido-value (Herbart's interest?) into larger idea systems or Freudian constellations or complexes, a sort of fusion of libido and idea, making for their dynamic quality. The whole cannot be more nicely described than in the very language of Freud: "The wish is the father of the thought" which might be continued in the old phrase "The thought is father to the deed." This unconscious thought process follows the regular pleasure-pain principle, and the associations formed contrast strongly with the more conscious reality-logic. For example, the dream presents strikingly the mode of unconscious reasoning.

Freud opens up a new vista in child psychology when he emphasizes strenuously that "all neuroses have their foundations laid before the fifth year" and that "the infantile is the uncon-

scious." The significance of these statements immediately becomes clear if it is assumed with Freud that the unconscious libido of early childhood is not yet repressed by cultural or moral standards executed by consciousness, but that it has free spontaneous play. Later, when cultural standards impose themselves, the adolescent consciousness represses childhood strivings of the libido, leading to what Freud calls amnesia. The major unconscious complexes of childhood then are the Oedipus—and Electra-Complexes. The babe soon selects the parent of opposite sex as his or her favorite or love-object. The male child loves incestuously his mother, and the female child thus her father. Up until this time sex selection has been limited to the family circle. Even among the healthy-minded it is hard to become unattached from these infantile sexual fixations, and the subject is found later falling in love, he or she knows not how, with an extra-familial love-object which is the replica of the father or mother prototype. A great deal more difficult is the freeing at puberty when the fixated parent has unconsciously and unduly encouraged the attachment. The neurotic child must later find himself or herself incapable of freeing himself or herself from these infantile and incestuous sexual aims. While for the most part the sexual life of the child is latent, nevertheless it manifests itself in what Freud calls polymorphous perversity such as suckling, thumb-sucking, stimulation of erogenous zones, infantile masturbation, exhibitionism, narcissism, playing, springing, running, seeing, hearing, urinating, defecating, anal-eroticism, muscle-eroticism and thigh-friction. Retardation at any one of these forms of libido-manifestation may lead to adult sexual perversion of a purely psychoneurotic type.

Puberty is the period during which the sexual instinct comes to maturity. Along with the fuller pubescent awakening of the libido comes the more stern repression of it by consciousness to adjust the individual to the environment. The adolescent is now confronted with a more difficult struggle. Hypertrophied self-consciousness sets in, likewise an increase in dreaming. Around this period the adolescent may suffer sexual shocks or traumata; and if the nervous constitution has previously been oriented about the father or the mother in undue proportion, thereupon results a manifest flight from reality in hysterical attacks. A psychoanalyst or doctor may cure the patient of his or her disequilibration only to have the *Affekt* transferred from the mother or father to the physician. This transfer (*Uebertragung*) may continue from person to person, even to a sublimated suprapersonal love of

God. It is in the directing of the love impulse to reality that Freud sees the panacea of all psychoneurotic maladies.

Wholly another etiology Alfred Adler assigns to the psychoneuroses. "The picture which one derives from Adler's system is founded entirely upon the impulse of aggression. It has no place at all for love. One might wonder that such a cheerless aspect of life should have received any notice whatever; but we must not forget that humanity oppressed by its sexual needs is prepared to accept anything if only the 'overcoming' of sexuality is held out as bait." The above quotation is from Freud[3] and does reasonable justice to the relative positions of the two men, notwithstanding the wake of sarcasm it carried with it.

Adler, reducing the philosophy of Nietzsche to a psychology, makes of the will-to-power (*Wille-zur-Macht*) the basal instinct of life and primarily identical with the evolutionary nisus. Thus the will-to-live is equivalent to the will-to-power. The exuberance of life manifests itself in great deeds, and supremely so in the lives and accomplishments of great men.

Adler sees the genesis of the will-to-power instinct in sex and more specifically in the masculine sexual energy. Thus all masculine emotions, instincts, traits of character both psychic and physical represent the manifoldness of the will-to-power. In such a manner may be ascribed to the will-to-power all varieties of tendencies as the following: the ego-impulse (*Ichtrieb*), the aggression-impulse (*Aggressionstrieb*), the will-to-survive, the struggle for existence, the conquest of nature, cruelty, murder, sadism, war, selfishness, avarice, suspiciousness, envy, asceticism, self-love, the tendency to disparage others, the will to be leader, jealousy and revenge. This masculine urge encounters in its upward career through organic life various obstacles both organic and environic which it must overcome. The supreme obstacle is of an organic nature; and, as Adler shows at length,[4] organic deficiencies or inferiorities as anomalies, especially such as of the palatal, conjunctival, pharyngeal and patellar reflexes, elicit the assertion of the will-to-power or the masculine protest to superiority. Environic obstacles which evoke the feeling of inferiority (*Minderwertigkeitsgefühl*) are such as rank, morality, social esteem, birth and wealth. Here mechanisms must be resorted to by the will-to-power in order to overcome such as:

1. Compensation, or that mechanism by which the will-to-power asserts itself through another channel than through

[3] "History of the Psychoanalytic Movement."

[4] "Studie ueber Minderwertigkeit von Organen." Berlin, 1907.

the one blockaded. For example, an ugly person may compensate for this organic defect by psychic superiority (*psychische Mehrleistung*). The compensation is always away from feelings of femininity towards feelings of masculinity; from weakness towards strength; from love towards hate; from passivity toward activity; from inferiority towards superiority; from below towards above; from insecurity towards security.

2. Security-tendency (*Sicherungstendenz*). The neurotic of the Adlerian type sets a goal for his will-to-power, and this goal or guiding-idea becomes a refuge from reality. In the more neurotic individual these goals are but neurotic fiction without much regard for reality and actual attainment. The more accentuated fiction orients about the maximation of self and resembles the delusions of grandeur in paranoia and dementia precox. The neurotic sets out upon his or her "historic mission." The inability to act out this fiction results in the bankruptcy of the "mission." The neurotic collapse frequently culminated in insanity or suicide is but the dirge of a smattered ambition.

At several crises in life, feelings of inferiority are strongly elicited as at menstruation, the epoch of menstrual activity, the epoch of sexual activity, pregnancy, puerperium, climacteric, examinations, danger of death, stage of fitness for marriage. At such crises the masculine energy if possessed in any degree seeks to assert itself.

Adler sees in the right-directing of the aggressive will-to-power (egoistic) impulse to reality a panacea of all psychoneurotic maladies.

IV

Into the theoretical antagonism between these two doctrines of the neuroses enters significantly the personal equation. That is to say, the two great founders are themselves complementary in character-type. This explanation has already been intimated not only by Freud and Adler themselves but also by Rudolph Reitler, Paul Federn, Carl Jung and Alphonse Maeder. The present paper will merely suggest the bisexual nature of the above-mentioned complementariness between Freud and Adler.

To understand the psychoneurotic constitutions of Freud and Adler is to become at once acquainted with the masculine and feminine principles. On this point Freud and Adler themselves are much in accord, if we may rely upon the suggestions which emanate from their respective statements.

Thus Adler writes[5] that every nascent constitution has latent within it both sadistic and masochistic components. Heredity and environment determine which of the two components shall be evoked and shall predominate in the individual's life. Masochism in his estimation is equivalent to the feminine *Sexualtrieb*, i. e., to the Freudian diathesis; sadism to the masculine *Aggressionstrieb*, i. e., to the Adlerian diathesis.

On the other hand, Freud[6] has come to the same general conclusion. Thus he writes: "The picture which one derives from Adler's system is founded entirely upon the impulse of aggression. It has no place at all for love." The same chord is struck when Freud[7] retrenches in admitting that the beginnings of hate, of aggressivity, go back in the psychogenetic scale very far, and hate is as strong if not stronger than love.

Provided we assumed each *Neurosenlehre* as the unconscious exteriorization, projection or expression of its founder's inner psychic life, we are privileged to probe the deeper psychic constitution of the respective men by use of their theories.

Sigmund Freud has given us no factual history of his life save in a few personal references. These latter relate to his Jewish extraction, his pacifistic tendencies in counterdistinction to the Teutonic aggressivity in the late World War, and his extreme sexual-mindedness as evidenced throughout his theory of the neuroses and which strikingly countenances the strong sexuality attributed racially to the Jewish male.

More striking for the present paper, however, are the symbolic self-revelations of his feminine inclinations in his "neurotic fiction," i. e., his theory of the neuroses. For convenience the projections of his mixed soul of predominantly feminine inclinations may be tabbed off as follows:

1. Outstanding is his primary emphasis upon woman, *das ewig-Weibliche*. His experimentation is for the most part confined to woman, with whose soul he has an innate sympathetic rapport. This inner *Einfühlung* into woman-soul is peculiar to his own constitution, i. e., he himself in psychic life is predominantly woman or womb-man, to use the Anglo-Saxon word. On the other hand, his theory which has such great significance for our knowledge of the feminine psychic life gives but secondary importance to the masculine soul. For him masculinity exists only as a repressing agent or as a subsidiary completion of woman. The Freudian man is a

[5]Adler's "Zur Kritik der Freudschen Sexualtheorie der Nervosität," *Heilen und Bilden*, 1911, and "Der Aggressionstrieb im Leben und in der Neurose," *ibid.*

[6]"Zur Geschichte der psychoanalytischen Bewegung." 1914.

[7]"Zeitgemässes ueber Krieg und Tod," *Imago*, 1915.

parasite upon woman, to whom he owes his very existence. This matter of male parasitism is couched nicely in the following by Belfield: "For in many animal types there is no male; when he does appear he is at first merely a parasite upon or within the body of the female." On such a level the male lives only for the female and has not evolved to such a stage that he lives for himself.

Here Freud agrees with the conclusion of Bucura over sex-differences that the female sexual impulse is primary; the masculine secondary. The female's supreme biological mission orients about reproduction, which mission is fulfilled through sexuality. In the words of the Middle Ages, "Woman is the priestess of sexuality."

In this entire matter Freud belongs to the type of men Fourier describes: "qui sont femmes par la tête et par la coeur." He is allied with the feminine soul. He is an instance to bear out the statement of Th. Gautier: "It often happens that the sex of the soul does not at all correspond with that of the body, and this is a contradiction which cannot fail to produce great disorder."[8]

2. There naturally grows out of the preceding his strong emphasis upon love, a paramount feminine sentiment. Here Freud is at one with Madame de Staël when she wrote that "Love, which is an episode in the life of man, is the entire history of woman"; likewise with Byron, who has phrased it thus, "Love in man's life is a thing apart; in woman's life her whole existence."

Again, Freud closely associates hunger with love, two very interrelated elements in the feminine nature—nutrition and reproduction.

According to Adler, who follows the great sex-psychopathologists, Moll, Krafft-Ebing, Hirschfeld and Ellis, love is masochistic and feminine, while hate and aggression are sadistic and masculine. These psychological traits are sustained by the findings of Blair Bell and Bucura that masculinity is characterized by domination and certainty while femininity is characterized by passivity and hesitancy. Otto Weininger attributes to masculinity the "liberating" impulse and to femininity the "uniting" impulse. Even Freud describes the masculine impulse, for him centripetally oriented about the erection of the male genital, as a dark impulse to mighty action, to penetrate, to dash to pieces, elsewhere to tear open a hole. But even this is the beginning of the aggressivity of which Adler writes and which Freud condemns as leaving no place for love.

[8]Theophile Gautier's "Mademoiselle de Maupin."

Only in so far as a man is feminine, i. e., possesses a feminine emotional life, is he able to love. For Freud the great regenerative force is love, which is excellently illustrated in his study of Jensenn's "Gradiva."

3. Countless anxieties and fears peculiarly group themselves about the feminine psyche: anxieties about the realization of the love life, and about the many partial impulses of love as tender feeling, maternal love, sociality, the *Musiktrieb*, the *Tanztrieb*, the home instinct, the love of the beautiful, the *sentiment d'incompletude*, religious love, timidity, morality, her organic and functional nature, the children and her male companion of whom she would like to be the mother.

In the words of Ovid, "Love is a thing full of anxious fears." Thus the neurotic fiction of Freud unmasks to us these many fears and anxieties of his male-female soul.

4. The prominence given the womb in the Freudian theory at once reveals the strong feminine strain within his soul. Characteristic of Freud is it to emphasize the womb as whence one comes and whither one is ever striving to return. It is the security goal of man. The primary biological function is that of the womb, the matrix of humanity. Thus in the hindrances to its function along the path of life lie all of human, alike male and female, neurotic struggles, according to Freud. Even in this matter of the eternal longing for the mother and for return to the womb Freud portrays the original parasitism of man upon or within woman. The longing for the mother in itself is a confession of femininely inclined masculinity in somewhat the sense as the popular language speaks of a mama's boy as one who is dependent on the mother and who has not enough masculinity to assert his individuality, his independence.

The womb is synonymous with femininity. Helmont of old phrased it: "Propter uterum solum mulier est quod est." The ancient Greeks saw in hysteria an affection produced by the unsatisfied womb, the inability to be a complete, genuine woman. Maeder in an article entitled "Ueber Zwei Frauentypen" points out the clitoris- and womb-types of women. The clitoris-type is already manifesting a strong *Einschlag* of masculinity, therefore is of the Adlerian diathesis. The clitoris-type can aid repression by the easy transformation or sublimation of the female sex-impulse into masculine aggressivity. This *Backfisch* would like most to be a boy; she dreams later very often thereof. She loves sport, hunting; she is passionate, violent, aggressive and enterprising. The womb-type woman, on the other hand, represents the approximation to the absolute woman or Freudian type. With

her the maternal instinct is strong. For us the womb-phantasy of Freud represents his symbolic effort to identify with woman the unearthing of his dual sex-nature with stress upon femininity.

5. In the matter of infantilism we also have a splendid apocalypse of his mixed soul. Symbolically the child represents undifferentiated sexuality in which both masculine and feminine, both active and passive, impulses alternately function. This a-sex-ensemble is attributed to the infantile by the folk-soul in the neuter gender of words, as *Das Kind, to nepion.* This is also strongly emphasized in Freud's idea of infantile polymorphous perversity in which thumbsucking, suckling, stimulation of erogenous zones, muscle-, skin-, anal-, mouth-, mucous membrane-eroticisms play a great rôle. Polymorphous perversity is symbolic of Freud's characterological mélange of femininity and masculinity. Rosenstein, speaking of bisexuality, writes in aphoristic form: "Der Mensch ist seiner Anlage nach polymorph pervers."

It is before the fifth year that the individual *Sexualrichtung* takes place. The dominant sexual character of femininity or of masculinity manifests itself. Whether masculine or feminine, this dominant sexuality is always accompanied by the recessive sexuality. Thus love and hate exist together in each individual.

Adler sees a compensation-correlation of inferiority to superiority between the infantile and the adult, between the feminine and the masculine, weakness and strength, which correlation is equivalent to equating the infantile to the feminine to weakness. The infantile is nearer to the feminine and therefore nearer to the womb and the phyletic. In this light is seen somewhat of the significance of the adage: "The child is father to the man." Symbolically the infantile represents Freud's weakness, his femininity, his bisexual nature.

From yet another standpoint the love of children is peculiar to femininity. There is no such thing as paternal love, says Dr. Kinkle. What we call paternal love is only the maternal love in man, owing to his bisexual nature.

6. Freud's major complexes, the Oedipus—and Electra-Complexes, are exteriorizations of the duality of love and hate constellations, or the duality of masculine and feminine principles within him. He can hate only in order to love; he can be man only in order to be a part of woman. These complexes formed before the fifth year are upon further sex-differentiation indicative of the co-existence of both masculine and feminine principles within the individual, whether predominantly masculine or predominantly feminine.

7. Repression, which plays so important a rôle in the Freudian doctrine, is highly symbolic of the femininity in his make-up. Rudolph Reitler sees in Adlerian masculinity the emphasis upon the repressing (*Das Verdrängende*); in the Freudian femininity the emphasis upon the repressing (*Das Verdrängt*). Over against the masculine expressivity is the feminine impressivity. Freud in giving prominence to repression reveals the feminine component of his psychic constitution. He feels as a woman, i. e., he feels repressed. In other words he feels the repression by the masculine within him, the repressing tendency of the Ego. In his exteriorization of repression he portrays his own mixed soul.

8. The emphasis upon the phyletic which is extradited in his theory of the neuroses is indicative of the femininity within him. Woman is nearer to the phyletic, the racial; she is the great eugenic force. Her supreme biological mission is of primary importance for the preservation of the race, an end for which masculinity and all other aims are of secondary consideration.

9. The unconscious again is representative of femininity in Freud's bisexual diathesis. His stress upon the subconscious points to his feminine *Einfühlung*. The supreme biological mission of woman is the deeper unconscious will-to-live of the race. Bucura indicates as a sex-difference that woman is more unconscious than man, that is, she is more instinctive or intuitive while man is more conscious and rational. Man is more the guardian or protector of woman, of the unconscious feminine. The deeper unconsciousness of the feminine soul is evidenced in the greater liability to clairvoyance, clairaudience, hysterical phenomena and hypnotism.

Some writers, especially Dr. G. Stanley Hall, see a difference between the Freudian and Adlerian theories amounting to a correlation between the Freudian feminine phyletic unconsciousness and the Adlerian masculine ontogenetic consciousness. Of course there is some of both elements in every individual with a predominance of the one or the other. With Freud it is, to be sure, a predominance of feminine unconsciousness.

10. Tender emotionality is predominantly emphasized by Freud. He has a horror of aggression, except in so far as subservient to tender emotion—a characteristic of femininity according to Bucura and Heymann.

If the psychology of the emotions and instincts be according to the masculine and feminine principles dichotomized into negative and positive, active and passive, or masculine

and feminine, the affectivity and impulsivity would require a classification of him more on the feminine side.

According to James's tough and tender-minded types, Freud belongs more to the tender-minded type.

11. The artistic impulse, the love of the beautiful, is strikingly portrayed in Freud's literary style and in the literary artistic lives and works which he analyzes. This literary-artistic impulse is peculiar to men of strong feminine admixture, as consistently observed by characterological psychologists. The question is raised that so few women have produced literary and artistic products. A tentative answer might be advanced that women incarnate beauty and love but do not possess enough of masculine energy to express it on paper or canvas, as writing as well as painting belongs somewhat to the active life. Whatever efforts have been made by women in the literary-artistic world have been made by the more masculine women. On the other hand, the feminine man possesses the proper mixture of love of beauty and activity to execute it upon paper or canvas. Too masculine men find art too delicate an activity. Nietzsche points out this difference among his supermen and calls the less masculine the Apollonian and the more active the Dionysian. The latter type is the preference of Nietzsche as superman. An interesting distinction is made by Carl Jung in his "Psychologie der unbewussten Prozesse," where he divides men into the intravert or thinking type and the extravert or feeling type. He classifies Freud in the extravert type and Adler in the intravert type. In his "Psychology of the Unconscious," Jung holds that the literary-artistic product is the fancy child of the mind—cherished with all the maternal love that an actual mother can bestow upon her own child—a phantastical vicariate of the actual product of maternity.

12. Finally needs be cited his classic phrase, "Perversion is the negative of neurosis," which conveys information of his own psychophysical disposition, namely, that he must not be classed with those so perverted in their sexual inclinations as to be called homosexual. Although his bisexual nature bears a feminine stress, he is still heterosexual in his inclinations.

The value accruing to the above self-revelations of Freud's own inner life rests mainly upon its bisexual nature. His life presents the struggle of masculine and feminine psychic forces with a predominance of femininity. He would assert the masculine protest, but the feminine which is stronger within him would incline him to the feminine protest. He would be a woman and true to his deeper nature because of the predominance of the woman-soul within him. Freud

is a man who presents the entire emotional life of a feminine diathesis; he has a complete *Einfühlung* or inner co-experience with feminine existence, an unquenchable impulse to be a woman, to conceive, to give birth, to experience the joys of maternity as in the case of the primitive *couvade-pratice* which he analyzes. In short, he knows how it feels to be a woman. This indelible feminine "*disponierende Anlage*" of his constitution breaks forth in his theory of the neuroses. For such a feminine diathesis, all repression, all feeling of incompleteness, are monistically condensed into the obstruction of the love-impulse, of the feminine eugenic force. However, from the functional side he cannot be an actual woman, although from the feeling side he can. This at once brings to the fore again the sexual duality of his soul. He plays a double rôle of man and woman. He acts like a man and feels like a woman; he is both subject and object. In his inability to become woman functionally, he is left free to sympathize with her and to doctor her ills. For him, love is a regenerative force—a resurrection of the phyletic, i. e., of woman's supreme biological mission—a spiritual recreation of man in woman.

Freud, true to the feminine soul, is of the tender-minded type which indulges in the delicate significance of love-dreams, artistic productions, symbolic language, the sexually comic and phantastical, the eternal feminine, the eternal infantile. For him the infantile (the feminine) is the unconscious.

The greater the repression of the feminine love-impulse, the greater the intensity of the love-energy and the sublimation or refinement of the impulse and the more delicate the erotic symbolism and autistic thought processes. Sadger draws attention to the fact that increase of sadistic impulse on the one hand increases correspondingly the masochistic impulse on the other. The same phenomena may take place all within the one individual of bipolar sexuality. Repression is sadistic, and with its increase comes the intensification of the love impulse and the erotic psychoses. For Freud the complex of the repressing and the repressed is strong, i. e., within him is the sado-masochistic complex with stress upon the masochism.

By way of parallel to Freud in many respects is the life of Jesus Christ, a Jew, who when his people were oppressed by the more virile Romans, in a sublimated spiritual sense, proclaimed himself the savior of man, and who in the Freudian sense revolted against his father and rescued his mother. In a highly sublimated sense he exteriorized a Kingdom Come from the prototype of his mother's womb to which he

unconsciously longed to return. This incestuous longing or love sublimated to charity is the keynote of the Christian doctrine of salvation which to the masculine Nietzsche appears the religion of humility, of compassion, of inferiority, of femininity. The Christian faith, an incorporation of feminine intuitions, is that of sublime love with a morality of turn-the-other-cheek and that of which the chief virtues are faith, hope and charity, all of which judged in the light of the bisexual principle are essentially feminine and masochistic character-traits. A striking observation of the religious psychologists is that the Christian religion has more followers by far among the female sex.

The conversation between Christ and Nicodemus brings out in bold relief the impossibility of entering the Kingdom Come without being born again, without entering the mother's womb again in spirit rather than in flesh. Interesting again by way of parallel is the tender quasi-maternal love of Christ for children. His own much quoted words in this matter are in Matthew 18:3-6:

"Verily I say unto you, Except ye be converted, and become as little children, ye shall not enter into the kingdom of heaven.

"Whosoever therefore shall humble himself as this little child, the same is greatest in the kingdom of heaven.

"And whoso shall receive one such little child in my name, receiveth me.

"But whoso shall offend one of these little ones which believe in me, it were better for him that a millstone were hanged about his neck, and that he were drowned in the depth of the sea."

The same feminine strivings of Jesus Christ are they which predispose Freud.

It would hardly be amiss here to make some mention of Carl J. Jung, leader of the Swiss school of psychoanalysis. He has very much in common with Freud, differing only in his greater feminine tendency. In his neurotic fiction or his psychoanalytic theory he places even greater emphasis upon the unconscious, reverting to the deepest strata of the soul, the primal roots of food and fertility, called by him the collective or superpersonal unconscious—the very soul of the race or of woman. Thus it is he who has elaborated the mother-complex or the womb-complex. All neurotic struggle thus reduces itself to the longing to return to the womb—the security goal of man. In his analysis of the Freudian and Adlerian character-types into extravert or feeling-type and introvert or thinking-type, one without much perplexity

can readily see that Jung himself belongs to the feeling type—the Freudian type which inclines toward the feminine, the intuitive, and which recognizes the primordiality of affectivity.

Alfred Adler, likewise, has given us no traditional biography. Only here and there are gleaned important references to his personal life. Undoubtedly the incident which reveals to us a most significant insight into his psychoneurotic constitution is his personal antagonism to Freud. It will not be assumed that Adler was entirely masculine. He also possessed a bisexual diathesis but one in which masculinity was the dominant character. Adler as a student of Freud revolted against him and gave birth to his own theory of the neuroses in which aggression, masculinity and the will-to-power conspicuously feature. Diametrically opposed to the femininity of the Freudian doctrine is the masculine emphasis in the Adlerian theory.

Adler, endowed by heredity with pronounced strains of Teutonic virility, could not by nature bear subordination to the feminism of Freud. His neurotic fiction, i. e., his doctrine of the neurotic disposition, is an exteriorization of his own inner life. Adler is by no means as kryptic and symbolic in the projection of his inner psychoneurotic life. In his doctrine he portrays with no concealment his masculine tendency. The sexual duality of his nature is portrayed by him in his continual emphasis upon such dualisms as masculine-feminine, adult-infantile, strong-weak, active-passive, hate-love, aggressivity-passivity, superior-inferior, above-below, sadistic-masochistic, healthy-sick. In Adler himself there exists the prototype of this bipolarity of masculinity and femininity or of this sado-masochistic complex. Between the two poles there is working a compensation process—a will-to-power—the assertion of the masculine protest. In other words, from a bisexual standpoint we may speak of Adler as a Man-Woman. The man in him is in the predominance through heredity. This masculinity expresses itself in a will to differentiate itself from the woman in him, the will to assert masculine autonomy, to be above, to be a genuine man (*Vollmann*), the neurotic struggle of the *Ich-trieb*.

Adler recognizes that the masculine and feminine principles originally were of a hermaphroditic source (in micro-organic realm) and that the two principles which now correspond roughly to male and female of the species are fundamentally evolving along different lines. This primitive hermaphroditism is recapitulated in each individual, i. e., each individual is a psychosexual hermaphrodite or psychosexual pseudoher-

maphrodite. He sees in the masculine principle aggressiveness, will-to-power, *Ichtrieb*, sadism, hate, all of which he himself incarnates.

Organic inferiority as well as general feeling of inferiority, both of which are given a great deal of prominence in his theory, represent the horror of being a woman, of being less than a genuine man. It is a revolt from the parasitism within or upon the female to autonomous development. For man to be deficient in his organic mechanism is to be like woman and forces him back to a primitive level of being a subsidiary completion of woman or to be dependent upon her, hence a dread of organic inferiority. The predominance of masculinity over femininity in the bisexual character-complex issues in the masculine protest, the compensatory will-to-power. Adler holds that the organ inferiority pushes back its source to the sexual apparatus and thus to heredity. In this manner he attributes inferiority to a return to the likeness of woman. The masculinity within him will atone for such foetal or prenatal insufficiencies. Psychically or functionally he will compensate for somatic defects with being superior. He will be "above," will be the man behind the throne, he will make history as a security goal.

A parallel to Adler is in the neurotic life of the Anti-Christ, Nietzsche, who glorified the superman, extreme individualism, the eternal masculine, the will-to-power and the sadistic morality of might makes right.

The literary style of Adler is rugged and masculine as compared with that of Freud. He is blunt, and his lines burst forth with anger and hate, according to Freud's estimation. The analysis of literary-artistic subjects is rare indeed with Adler.

Adler, true to the masculine principle, is of the tough-minded type which indulges in selfish reveries of power, hate, revenge, self-maximation, sadism, reality-thinking and activity. The unconscious does not occupy so important a place in the masculine diathesis as with woman, whose orientation is almost entirely inward and downward to the organic. On the other hand, the masculine impulse is always oriented upward and outward toward conflict, with external stimuli involving the higher mentation. Man is the superstructure of woman.

Extremely significant are the contrasted types of women with which Freud and Adler respectively deal. Only women of a strong masculine diathesis are those who fall under the analysis of Adler. They are women who would be men and who are, to be sure, masculinely constituted physically as

well as psychically. Such women number among themselves those called militant, those called courtesans and vampires, those who, Joan-like, hold masculine positions, who refuse marriage and the rôle of motherhood, those who strongly believe themselves the equal of men and even vie with him in physical as well as mental endeavors and finally those whom Magnus Hirschfeld in his "Die Transvestiten" and Havelock Ellis in his article "Sexo-aesthetic Inversion" describe as ambitious to become man-like in the matter of wearing-apparel as well as of bobbed hair. Wherever masculine tendencies are struggling for expression in either sex, there we see a fitting application of the Adlerian analysis.

Psychoanalysis has reiterated the sayings of the Scriptures that, as a man thinketh, so is he; or judge not that you be not judged, in that the thought of a man is an unconscious exteriorization or self-projection. Why then should it not be perfectly legitimate to judge Adler by his theory as a bisexual with masculine strivings in the ascendency?

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EDUCATION IN FRANCE SINCE THE WAR

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I—The University

At first the war threatened to close our schools and interrupt the work of instruction, and unfortunately it too often impaired the latter by taking from it teachers, students and premises; but instruction was stopped or abated only in the invaded regions, and everywhere the war awakened admirable zeal for retaining academic work in school, for exalting patriotism among the students, as well as for organizing their co-operation in wartime activities. That zeal worked miracles,[1] and the school was largely spared the moral depression which followed the war. Better yet, it is unquestionable that by reason of its own initiative and of painful necessity, enthusiasm and desire for progress have asserted themselves in the university. In order to give here a brief but faithful testimony of it, and yet stick to facts, we shall consider in order the different kinds and grades of public instruction.

Higher Education—Higher education is still insufficiently endowed. Its installation and material resources are still below normal status and what is its due. Like education in general, it has not the place it should have in public esteem, but there is undeniably progress as well as effort to extend and revive it (1) within the organization and (2) in its work of expansion.

I. Material and financial means are lacking for the advancement and dissemination of science, and buildings, laboratories and collections are too meager. Not only are our finances inadequate, however, but the cost of retaining what already exists has doubled or trebled. Nevertheless, without mentioning increase of salaries, in each of the latest budgets sums have been added for improvements of property and supplies, while laboratories are being more and more generously endowed. We wish, especially, however, to make flexible, to enlarge and to animate the organization itself, its programs and methods. The courses in law and medicine

[1]W. Thamin, "L'Université et la Guerre." Hachette.

have been reorganized and lengthened. The reform for the degree of licentiate in letters (*licence ès lettres*) has introduced the régime of the degree of licentiate in sciences (*licence scientifique*). Four *certificates* for studies, chosen optionally, except for the degree of licentiate of instruction (*licence d'enseignement*), from those offered by each faculty give the title of licentiate (*licencié*) without obliging the student to take all under the same faculty, a system favorable to elective studies, to the convenience of foreign students and to attendance by the same student at several universities. Life is broadened and liberty extended also by the creation of faculty or university *Institutes*, drawing together, in collaboration productive for research and instruction, diverse groups hitherto closely juxtaposited or even actually separated. Another innovation is the expansion or rather creation of features advantageous to the students (dormitories, centers, and dining halls not run for profit, playgrounds, athletic fields, etc.), and the idea of admitting student representatives at least to certain meetings of the university councils, and with certain reservations, is gaining ground. Above all it would be impossible to overestimate the importance of the decision to admit to university councils "lay" members, individuals prominent in the city or region; this "liaison" is of great interest and has already manifested good results.

A vigorous impetus is bringing progress to higher technical instruction (agricultural, industrial, commercial) in special institutions as well as in universities (Grenoble, Nancy, Lyons, Toulouse, Lille, Bordeaux, etc.) where institutes of applied science are increasing in number, and these institutes are inviting distinguished patricians as professors, more and more, thus forging new links between each university and the environment in which it labors. Better yet, if possible, certain universities are ready to organize—as English universities have done at the request of trades unions—a popular higher education introducing science and scientific work to a select group of manual workers. In some places this may soon be a reality.[2]

Hereafter the faculties of science and letters will collaborate directly in the training of primary teachers. It will be possible, if not obligatory, to substitute for the first part of the requirements for the special certificate for teaching in normal schools (*Certificat d'aptitude au Professorat des Ecoles Normales*) three university certificates; a licentiate degree (*licence*) will also be equivalent to the second part. Finally, many

[2]*Semaine pédagogique de Lyon*, "1920 Conférence de M. le recteur Toulin."

wish that closer relations might be established among the universities by granting to students liberty of passing more easily from one to the other, and by exchange of professors.

II. Every day there is developing more and more intensely, and more flexibly, the movement for extension of our higher education in foreign fields. Favored or demanded by parliament, the Ministry has organized the National Bureau of Universities (*Office National des Universités*), the Pedagogical Museum (*Musée Pédagogique*). Not only is there an increase in the number of exchange professors with America, very recently with Belgium, Italy and Spain, not only are we receiving more and more foreign students and sending to foreign countries men and women scholars, but we are consolidating those relations by permanent estalishments. At Paris especially chairs have been created by foreign governments (United States, England, Czecho-Slovakia) and in these countries and others (Roumania, Serbia) for our professors. Last October a Chinese university was established at Lyons. Reciprocally France has established instruction, or an entire system, in some of these countries, as our Institute of London, of Florence, of Madrid, of Syria (schools of law, medicine, technical school of Beirut). There is under consideration a plan for combined organization of scientific and university relations between Japan and France, and with apologies for unintentional omissions I insist that this entire service is growing and assuming definite shape both in the Ministry of Public Instruction and that of Foreign Affairs as well as in each university.

Secondary Instruction—Secondary instruction is on the eve of a reform which will perhaps be an accomplished fact when these lines appear. As we are trying to reform it at one stroke, without partial experiments, it would be impossible to introduce in it the various innovations which I have indicated in higher education. During the war it, too, lived by an admirable effort. Since the war the *lycées* for boys have regained part of their personnel, the teachers who survived, and they have resumed their regular life, diligent in spite of everything, and in spite of the complaints that are heard. This group, like all others, has engaged in a heated campaign to obtain necessary increase of salaries and without doubt a happy innovation, born of circumstance, may be expected—a spirit of solidarity which, forcing the hand of the old individualism, has drawn together in associations and federations not only the entire personnel, men and women, of the secondary schools, but also all the members of the university corps

and of the three branches of instruction. This spirit, one may hope, will survive fortuitous demands and, moving forward, will give its attention to pedagogical questions.

This is the principle of the generous enterprise of the *Compagnons*, young officers who discussed educational matters in the army, even in the trenches, and in some articles which appeared later in two volumes under the title "The New University" (*L'Université Nouvelle*) shook public opinion and proposed an entire plan of improvement.

At first a radical, indeed revolutionary, system was offered, uniting free education in a vast university corporation, defending Latin, and the school unique, demanding especially connections between the different stages of the university system, and then between that and society. This bold program was afterwards modified: the corporation and Latin were abandoned, but the principle of the school unique (without formal organization) and that of connections were retained.

The question of reforms was studied also in remarkable investigations by the Society of Civil Engineers and by *La Plus Grande Famille*, both advocates of a principle of disinterested and preferably Latin culture. This has been submitted to public opinion by the Minister and has been put before properly constituted organizations. The Superior Council is going to deliberate on it; the battle between partisans of unique secondary education with Latin, and these of the two parallel groups, classical and modern, will doubtless be heated. But aside from this conflict, which, unfortunately, often becomes a political quarrel and finally clouds the rest, what progress might rightly be expected from the reform; reduction of class hours already begun in a small way to twenty a week; physical education; abolition of required courses; relief, always promised, always postponed; programs; increase of individual work on the part of the students; suppression of colleges which are vegetating; more general admission of primary pupils of worth, and exclusion at entrance or even in preparatory courses, of mediocre or even gifted students adapted to a different contribution to society. A great step forward would be to disengage our secondary education from whatever makes it dull or perverts it; that is what the eminent worth of our teachers demands.

Finally, more and more pressing is the problem of secondary education for girls, which certain people would like to make absolutely identical with that for boys and which must in any case procure for an increasingly large proportion of its clientèle access to lucrative careers.

Primary Instruction—While awaiting the change which will undoubtedly come to it after the others, the elementary school has preserved its prescribed limits and methods; the extension of the course to fourteen years is still under discussion. Let us point out only the progress of instruction in practical arts and physical education, to which a little more time is given in some places.

The teachers have entered with especial ardor the campaign for increase of salaries; but here too one must note as progress the spirit of solidarity which has drawn them to the two other groups.

The most important innovations are the thoroughgoing reforms in the higher grades. This is especially the task for directors of primary education. There has been a desire to make flexible its scope and programs, to animate its methods and to raise its level even to that of scientific work.

The extra years' courses, which used to add only one year to elementary studies, are becoming substitutes for the upper primary school, allowing, according to their clientèle, extra courses of even four years, and adapting themselves to needs, whether general preparation for normal school or professional education, especially agricultural, and finally combining with industrial courses.

The rôle of higher primary schools is "to form human beings who, under the direction of leaders from the universities and higher schools, may constitute the framework of the economic and administrative army; foremen, overseers, clerks." They are preparing students for city careers and normal schools. The duration of their studies, instead of being limited to three years, can be prolonged to four or five. Hitherto rivalry, at the risk of useless repetition, existed between these and the technical schools, which are under the control of another Ministry; and the duality, if not conflict, seemed incapable of solution. It has just been settled, thanks to the creation in the Ministry of Public Instruction itself of an under-secretaryship of technical instruction. In each of the two kinds of schools either general or professional education, one of which will be subordinate to the other, will predominate, the two personnels will no longer be controlled by two Ministries, the program of the upper primary schools is lightened; above all, instruction will no longer be concentric, but progressive; each year the student will see something new, will have the knowledge and pleasure of advancing.

The same idea dominates the more radical reform of normal schools. They are retained instead of being replaced by pedagogical institutes of the university or reduced to one year of

professional training following classes in the *lycée*. They remain primary; but the régime of 1909, which superposed on two years of preparation for the higher diploma (*brevet supérieure*) a year of both personal and professional training, has been given up.

The student may enter at fifteen years, not after nineteen; but as, after 1923, every teacher in a public school will be obliged to have passed at least one year in a normal school, *auditors* will be admitted up to the age of twenty-five. For three years they will pursue in parallel courses, or rather in closely related ones, general and pedagogical training, inseparable for a future teacher. The higher diploma (*brevet supérieure*), achieved by stages, becomes the simple, natural end of these annual studies. Dominated by an entirely new spirit, these studies will have to deepen rather than to extend knowledge, to train intelligence down to basic principles, to form it by handling documents and realities, so that the teacher may indeed be above his calling. He will go to sources, will have a foretaste of methods of higher education, will have an opportunity to preserve, even in his profession, freshness of point of view and the curiosity of research. On leaving normal school he will be on the level of a good student in the philosophy class or a first-year student in the university.

The moral program insists on professional obligations and the duty of the incumbent to remain loyal. Psychology will have as its principal object as scientific a study as possible of the child; here is added a daring innovation, experimental psychology with exercises in observation and laboratory work. Another novelty, and one which headmasters, teachers and students like, is the introduction of sociology applied, of course, to ethics and education, but destined, it seems, to furnish connecting links and the directing idea for all branches of instruction. There is, however, superposed a study of general principles of science and ethics; this will form in future school teachers philosophical and critical spirit, not removed from truth and moral realities, to which, says the program, every system gives only interpretation, not the lie. Likewise, the teaching of history must inspire love for the genius of France and will be faithful to the national spirit, of which teachers must be representatives in each commune and each school. Finally, professional preparation will cover at least fifty half-days a year; and all practical exercises—thereby are understood practice lessons—will be held in a primary school.

The breadth of ideas and noble ambitions which are translated into this reform are apparent. To some it seems too

ambitious to be practical, and there is fear that recruiting of pupils and even of teachers, will not be adequate. The future will tell, and the experiment is worth trying.

This reform necessarily involved one in training normal school teachers and upper primary teachers. Their special diploma or certificate of aptitude (*certificat d'aptitude*) has also been much modified, in accordance with these very programs, and made to approach more nearly to university studies; for the second, as well as for the first degree, may be substituted certificates from a faculty (*certificats de Faculté*). The examination of Primary Inspection, also modified, will allow a written test on ethics or sociology.

Reformed by the instructions of 1908, kept functioning by a personnel of general and departmental women inspectors the "mother's school" (*école maternelle*) has made great progress, especially in the past year. Less and less has it become a school, more and more maternal. Physical care, games, manual exercises which are also games, singing and rhythmic movement there occupy the children in an atmosphere of joy under gentle discipline of good habits. Setting aside all systematic dogmatism, but better and better informed, the best teachers use freely whatever in each new system, Montessori or any other, is suitable for the French temperament. Certain classes, though crowded, are admirable, and the example they give is contagious.

Technical Education—Since the war technical education has been the object of special attention and solicitude. Reorganization is planned not only by specialists but by eminent statesmen, by the Chambers of Commerce, Agriculture, Industry. It has been eagerly undertaken by the Under-Secretary of State recently established in the Ministry of Public Instruction. The Chamber of Trades, demanded by the last Industrial Congress held at Lyons, will have an important rôle in it. The great problem is that of the part that should properly be left to general culture. In spite of this, definite plans will doubtless soon result in a well-organized system in which technical instruction of all grades, primary, intermediate, and higher, will harmonize with the others.

CONTINUATION SCHOOLS IN NORWAY

WITH A SHORT OUTLINE OF THE NEW NORWEGIAN NATIONAL BILL FOR COMPULSORY CONTINUED EDUCATION

By Martin L. Reymert, Ph. D.

According to available statistics for the summer 1919 (end of public-school year 1918-1919) the situation for the children leaving the public grade school may be summed up thus for sixty-three Norwegian cities and towns:

Children leaving from all cities and towns: 10,322. Number of above getting no further schooling: 5,961, which means that more than one-half of all children in Norwegian cities and towns had no plan for further schooling after graduation from the seventh grade (average age, 14-15) of the public school. It must be added, however, that some children do go back to some continued schooling after they have been working for some time.[1] These are of course not included in the above figures. If numbers were available for the country districts, they would most likely not show any better aspects.

Continuation Schools in Norway, 1921

Up to the time of the new bill, now before Congress, we had in our state school laws some short general suggestive regulations concerning continuation schools. These may be summed up thus: Continuation schools may be established as classes or courses of from 4 to 10 hours a week. The schools shall be administered by the local school-boards, but the State Department of Education must approve the schedules. The continuation schools are meant to be for young people 14-18 years of age. The instruction shall be given free of charge. The above is about all there was said up to the present proposed bill for compulsory continued schooling. In the meantime, however, quite a number of continuation schools were established both in city and country districts, and recently a great interest has manifested itself all over the country—for more continuation schools.

[1]For "Adult Education in Norway" the reader is referred to Prof. Dr. Otto Anderssen's treatment of this subject: Bulletin III of The World Association for Adult Education, February, 1920 (13 John Street, Adelphi, London, WC. 2.)

Examples of Now Existing Continuation Schools

Kristiania Continuation School for Girls—Started, 1900, with 20 pupils a year. 1919: 41 regular classes and 24 practical evening courses, plus 6 day classes. All in all, 100 women teachers, all of them with regular and special training, many of them having studied continuation schools in foreign countries.

The day classes have 30 hours a week for 10 months per year, the evening classes up to 10 hours a week for 8 months per year, all throughout 1, 2 or 3 years.

The course of study is in the main the same for the day classes and for the two yearly evening classes:

1. Manual training: Dressmaking and sewing of baby outfits; millinery; domestic service.
2. The mother-tongue, including sociology.
3. One foreign language (English).
4. Book-keeping and mathematics.

To the above is added, in the day classes, hygiene with gymnastics and outings, plus one weekly hour of Bible reading.

Singing is not a separate subject, but shall be taken care of during the school hours. Also for the evening classes one tries to get gymnastics in for those who can possibly give time to it. Special social evenings are arranged.

Practical history, geography and natural science are included in the mother-tongue lessons and are given in connection with topics of the day, daily events, etc., a main principle of the continuation school being the keeping in close touch with practical life of today. Therefore practical sociology also has a broad place, including topics as "The Family," "Parents and Children," "Matrimony" (and laws concerning this), "Social Institutions," "Employer and Employees" (laws). "Vocational outlook" is given with special reference to the particular trade schools the girls can enter upon leaving the continuation school. The school has its own library. Literature and arts, especially of modern time, are given consideration (mainly within the mother-tongue), and everything that might have an inspiring influence upon the girls is looked for.

Practical outlooks (especially for the pupils of the day school who have time) are given by visits to orphans' homes, children's hospitals, "first-aid" places, the market-places (open squares in the city where the farmers sell their products directly to the consumers), butcher shops, groceries, bakeries, cooking schools, dressmaking factories, etc. Goods, prices,

methods of work, etc., are thus brought home to the girls. Practical museums are also visited. Here the girls may make sketches, for later use in their own sewing, embroidery, etc. The school has also a special trade course for women tailors, frequently visited by all the girls. Outings are undertaken both summer and winter. Sea-bathing trips and skiing trips are most popular.

All the above is possible in the day classes.

The evening classes, with 3 evenings a week from 7 to 9 P. M. (1 or 2 or 3 yearly course) cannot afford the time. The third year of the evening classes is a business course only.

The domestic courses (dressmaking and millinery) are major subjects in the 1-year evening course, but minors in the 2-year course. From the 1-year course most of the girls go into housemaid service in the homes.

The 2-year course has by far the greatest number of pupils, as from this they can go over into business and trade. Upon leaving this course the girls are about 17 years of age. Many of the graduates of the 2-year evening course will come back to school for the 3rd-year business course, after some time spent in work, and a great many of these will include domestic-science courses as minors in their schedule. Statistics gathered by the school show that some of the girls often have a 12-hour day. (Job and schooling in the evening.) As has been touched upon, the school has two trade courses (of its own), one for women tailors and one business course (third year). These are (as the entire school) under the supervision of the city school board by special appointed committees consisting of members having the particular trade training or knowledge. The schedules are approved by the State Department of Education; the cost is covered by city and state, so that the schooling is entirely free for the pupils.

Prerequisite for the course for women tailors is graduation from the 1-year course in the continuation school, or a similar training. The instruction in this course comprises dressmaking (daily and society dresses). The obligatory instruction in drawing is given in the State Trade and Art School, Kristiania. The school has a great many customers, and some of the pupils are given a small fellowship. Upon graduation the pupil is supposed to fill her place as an apprentice in a sewing establishment, and later on in her job she may take the by law prescribed and controlled "Svenneprove," that is, she must make *personally*, without any help, a society dress or a suit to be approved by a special official committee of tailors. (Similar official tests or examinations are by law prescribed for the admittance into all trades in Norway.)

Still later, then, the pupil can (according to the Norwegian trade laws, paragraph 3) obtain "haandverksbrev," official testimony of the right to carry on the particular trade as a master, with her own place of business, etc.

The business course (third year of the general evening continuation school for girls) has the following compulsory subjects: Book-keeping, general office work, business correspondence, typewriting. Electives: Stenography and English (as foreign language). The evening courses last 8 months (September–April). In April the test for book-keeping is given. The successful pupil in this is entitled to obtain "handelsbrev" (according to Norwegian law on business, paragraph 2.) This "handelsbrev" (official business testimony, compare the trade course) entitles its holder to start a business anywhere within the state of Norway—under his own name, and upon personal responsibility. In 1919 the business course had 10 classes, and 177 girls took the prescribed test.

The continuation school for girls has its own specially prepared textbooks for mother-tongue, foreign language, book-keeping and mathematics. The instruction is given in the city public school buildings.

Kristiania Continuation School for Boys—A general city school for boys, similar in the main features to the above described for girls, was started in 1899. In 1916 an eighth grade (elective) was added in the public schools of the city, with 30 hours (forenoon) a week. The above classes are administered by the continuation schools of the city.

General Continuation Schools in Other Norwegian Cities—From 1895 on, most Norwegian cities were provided with free general continuation schools, with program, etc., in the main patterned after the schools in Kristiania, either in the form of an added eighth grade or as evening schools (or both). In general the teachers for these schools are taken among the regular force of the city public school, both in Kristiania and in other cities. Each continuation school for boys and girls in Kristiania has an especially appointed head-master.

Special Continuation Schools

Technical Evening Schools—These schools date back to 1802, "Sunday Schools" in Bergen, Norway, and the now prevailing system received its state regulation in 1918. They are primarily created to meet the demands of the state laws regulating the executing of trade and industry in Norway and are therefore concerned about the training and schooling of the laborers in these fields. To be accepted the applicant

must be 14 years of age and pass tests in Norwegian and arithmetic, thus proving that he has at least reached the goal of a full public-school training.

The courses of these evening schools last for 3 years, with an opportunity for a fourth year if desired. The instruction is given for 8 months per year, with 10 hours a week, making 300 hours a year. Subjects are: Norwegian with sociology, keeping of accounts, mathematics and trigonometry, construction and projection drawing, free-hand drawing, natural science, technical drawing.

According to the Congressional Budget for 1921, there are now 60 of these technical evening schools (3 in Kristiania) and 3 state schools for drawing, with a total of 5842 pupils. Of the 64 cities and towns in Norway, 48 (with a sum population of 756,000 inhabitants) have such schools, while they are lacking in 16 cities (with a sum population of 17,700).

The course of study in weekly hours for the successive 3 years may be taken from the table below:

Weekly hours	1st year	2nd year	3rd year
Norwegian	2	2	1
Accounting	..	..	1
Mathematics and trigonometry	3	2	..
Construction and projection drawing	2	..	..
Free-hand drawing	3	..	..
Trade technical drawing and instruction	..	6	5
Natural science	..	..	3
Sum	10	10	10

The Department of Education divides the schools into three groups:

Group I. Mechanics, blacksmith, tinsmith, wagon makers and carpenters. These get 4 hours trade-technical drawing and 2 hours mechanics the second and third years.

Group II. All other trades, with 6 hours trade-technical drawing each year.

Group III. Electricians, with 3 hours technical drawing and 3 hours electrotechnique the second year and 2 hours technical drawing and 4 hours electrotechnique the third year.

Criticism:

1. Time of instruction, 6-8 P. M.
2. Lack of specially trained teachers.
3. Lack of special text-books.
4. Many pupils start some years after graduation from the public-schools, and thus they need a repetition of general courses.

Schools for Home Industries for Girls and Women in Norway —From the middle of the eighteenth and onwards in the nineteenth century one may take it from local literature that home industry had a high standing all over Norway.

As Norway got to be more and more of an industrial country, however, the home industry gradually went on the decline.

Men and women of public note then went on record for a renaissance of the home industry, and in 1861 an "Association for the Promotion of Home Industry" was inaugurated. In 1865 this association started training courses in straw plaiting (basketry) in fourteen different localities. In 1875 a central school for home industries ("Den Kvindelige Industriskole i Kristiania") was established in the capital. In 1900 this was taken over by the state, and since then this school has been the leading one in the country. It has now about 10,000 graduates. The school has a great variety of branches of study and work: Weaving, dyeing, tailoring, linen sewing, repair, ironing, classes for the training of teachers in manual work and arts for girls (art weaving, dressmaking, pattern drawing, etc.). Four to five hundred pupils now graduate every year. The annual fee is 65 crowns. Short courses of all kinds are also offered for a still lesser price. The pupils are awarded stipends and fellowships. There are now quite a number of such schools around in the country, patterned more or less after the one in Kristiania. In all public schools for children and youth in Norway, manual training for girls now has a great place. As a rule, weaving, linen sewing, knitting and some finer handicraft are included in this. Gymnasiums only have no such training, but it is found in all normal schools.

However (outside Kristiania), continuation trade schools in this branch which might bridge over from the general lower public schools of the country to the particular higher trade schools (mentioned above) have been lacking. This gap will now be filled by the new bill for compulsory continuation schools:

Household Schools—Special household and cooking schools date back to 1890, when the first one was established in Kristiania. In 1914 there were 34 such special schools in the country districts and 19 in the cities.

Since 1908 the state covers three-fourths of the expenses, the local community one-fourth.

In all country districts there are now "move-able" household-schools with courses lasting from 3 to 10 months. In a great many cities evening classes for cooking are established for adults with two courses (of 5 months each) per year. In

order to get trained teachers for all such schools in the country the state established in 1908 a state training school for household teachers, near Kristiania. Graduation from a normal school or similar training is the entrance requirement. This school has four divisions:

(1) Division A—For the training of household teachers. 1-year course. (2) B—For the training of teachers for the "school kitchens" in the grade schools. ½-year course. (3) C—For advanced training of teachers who have already been practising teaching. 6-weeks course. (4) D—Household school for young girls. ½-year course.

Room and board for divisions A and C is 35 crowns a month; for D, 25 crowns. The pupils of section B live outside of the school. Stipends are granted. Special schools for the training of housemaids are established in Kristiania and Tronhjem.

The first school kitchen in the grade school was established in 1890 in the City of Sandefjord, from private means.

In 1907, school kitchens and household instruction for girls were made obligatory in the grade schools of Kristiania (2 hours weekly in the sixth grade and 3 hours in the seventh). Almost all Norwegian cities now have obligatory school-kitchen instruction in the grades. The state pays the salary of an inspector for all the school kitchens of Norway.

This year (1921) the State has granted 10,000 crowns as an aid for the establishment of school kitchens in very small school communities.

Preparatory Part-time Continuation Schools for Trade and Industry

Besides some older general trade schools in Kristiania, Porsgrund, Bergen, with courses lasting several years, we have, since 1910, preparatory part-time trade schools in the principal cities of Norway. As an illustration of this type of school we may take Kristiania:

The expenses of these schools are paid one half by the state; the other half (plus buildings) is covered by the city.

The course of study is approved by the State Department of Education. The pupils must satisfactorily have graduated from the grade school (seventh grade). The schools are day schools. The time of the course is 6 to 10 months. The workshop training is given in the school itself. There are now in Kristiania sixteen such preparatory trade schools (with two additional more advanced schools for shoemakers and barbers).

The applicants must be from 14 to 16 and 17 years of age.

All these schools are gathered under one roof—in a separate building. The graduates from the 6 to 10 months' courses are given 1 year credit in abbreviated apprenticeship time. (This apprenticeship time is regulated for all trades by law.)

In Kristiania there are now such schools for the following trades:

(1) Metalworkers, (2) jewelers, (3) carpenters, (4) blacksmiths, (5) finer carpentry, (6) painters, (7) copper and tinsmiths, (8) masons, (9) bookbinders, (10) modeling carpentry, (11) moulders, (12) bookprinting, (13) calciminers, (14) paperhangers and interior decorators, (15) tailors, (16) barbers.

On this general background, then, the new national bill (now pending action in the Congress) for compulsory continued schooling in Norway comes in.

It might be taken from the above summary view that the opportunities for continued schooling have been plenty. The reasons for the public demand, however, that the state shall undertake to organize compulsory continued education by national law are, on the whole, the same as those that brought Wisconsin and other states in America to take similar measures. They may be briefly summed up thus:

1. Most existing continuation schools were evening schools, thus intruding upon the youngsters' well-needed free time.
2. Employers did not always grant the necessary free time from the job.
3. By centralizing the continuation schools under the state, uniformity in program, teacher training, text-books, etc., can be obtained.
4. By making the schools compulsory the state manifests its interest in the difficult adolescence period of the youth of the country.
5. The compulsory continuation schools will tend to raise the quality of work in "skilled labor" and the trades.

In March, 1915, "Norges Lererindeforbund" (the national association of Norwegian women teachers) took the first initiative towards the new bill and passed a resolution urging the State Department of Education to prepare and pass a new paragraph in the public-school law for the cities of Norway, establishing compulsory continuation schools for the cities.

The Congress Committee on Educational and Ecclesiatical Affairs acted favorably upon this resolution, but decided that the question of compulsory continuation schools should be taken up not only for the cities, but for the entire country.

The following year (1916) the "Storting" (Congress) voted to urge the government to prepare such a law.

The matter met with some opposition, however, and not until January 31, 1919, did the Department of Education name a preparatory committee. This committee consisted of known women and men teachers from the lower and higher schools of Norway, together with representatives of business and trade.

Right now the said committee has delivered its official motion to the Department of Education.

The proposition starts with a survey of the conditions now existing for the 14-15 year old child, now leaving the public school and entering a vocation.

The main features of the proposition follow:

1. Every city or city-like community in the country districts shall provide for a satisfactory number of compulsory continuation schools.

2. Proposals for the country districts shall be given by a committee named by the State Department of Agriculture.

3. These schools shall further the general education and character building of the pupils, prepare them for the vocation they choose and make them good citizens. The schools shall be compulsory, and the instruction shall be given free (of payment of fees).

4. The schools shall be arranged as practical schools. They may have a specific practical course as the main feature, or offer a general practical further schooling. Vocational classes shall be established everywhere, where conditions make it possible. By vocational classes is understood a special course that gives a complete training for tailors, mechanics, electricians of various kinds, etc. Work-shops shall be procured in connection with such schools.

5. For such vocational continuation schools a course: "arbeidskundskap" (all knowledge of everything pertaining to the particular trade or vocation; compare Kerschensteiner's "Arbeitskunde"). This particular course shall be given fully one-half of the entire school time.

6. The schools shall not only be vocational, but also have a cultural aspect. Thus social economy and a course in the mother-tongue shall be included.

7. As the pupils also have their jobs to attend to, during the schooling, the school time must not be long. Proposed: 8 hours weekly for 30 weeks a year, or 240 hours annually, throughout the 3 compulsory years of schooling.

8. If a child has 48 hours in all of work, in its job, 40 hours shall be given to the job and 8 hours to the school. No instruction is to be given after 7 P. M.

9. For children not yet having entered upon a vocation or trade, schools with general training courses shall be established. The curriculum here shall include social economies, a course in the mother-tongue, natural sciences and manual training.

10. The continuation schools shall by and by get to be independent schools, with separate buildings, equipment and teachers.

11. It is proposed that the state shall pay the salary of the teachers, and that the local communities furnish buildings, equipment, etc.

12. Administration. The local school board shall administer the schools, but for every vocational class there shall besides be named a vocational committee consisting of three members. One of these shall be named by the school board; of the two others, one by the local employers and one by the labor union of the particular vocation. This committee has the responsibility for everything pertaining to the particular vocational training, draws up plans, etc. Their proposals, however, must be passed upon by the school board.

13. The State Department of Education shall have the upper authority.

14. All teaching positions shall be filled by the State Department of Education through competition and by proposal of the local school board (the same as for the higher schools of Norway).

15. Beside the compulsory 240 hours annually in 3 years, opportunities for further free schooling shall be offered in general school subjects, practical courses and foreign languages.

16. For hours of instruction the number of pupils in a class shall not exceed 30; for instruction and work in the work-shop, not 15.

17. This law is proposed carried through within the first 5 years after it has been passed upon by Congress and government.

Finally, free day schools with 30 hours weekly instruction for 1 or 2 years may be established as an eighth and a ninth grade of the public school. The annual expenditures for teachers' salaries are estimated at 2⅓ million crowns.

The above motion is as yet not passed upon by Congress and government; however, everything looks hopeful. The economical considerations will be the hardest ones to overcome. If the motion will not go through in full, it is safe to say that much of it will very likely be preserved by the final action upon the bill. When the final action will be taken is

uncertain, but it is expected in the near future. Besides the above outlined bill for continuation schools, the same committee has also proposed a series of specific trade-business and other vocational schools.

THE REVISED AND EXTENDED BINET-SIMON TESTS, APPLIED TO THE JAPANESE CHILDREN

By Y. Kubo, Ph. D.
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In 1918 I tried to measure the intelligence of the elementary-school children of Tokyo, following the Binet-Simon tests as much as I could. But the modification of the tests to adjust to our children was unavoidable, for our conditions are very different from those of Paris. Next year I published the revised tests, which were much welcomed by our countrymen as they were very applicable. But there were still many imperfect points in them, and I was obliged to revise them again.

The new tests consist of four at 2 and 3 years of age, six at each age level from 4 to 14, and twelve alternative tests, while the old ones contain five at each age level from 4 to 13 without alternative tests. Another important revision of the new tests is adoption of many performance tests to lessen language difficulty, the Otis tests and the army tests to measure the higher mental abilities in older children.

The methods of the new tests are summarized as follows:

Two Years (4 Tests, Credit 3 Months Each)

1. Names the members of the family. (At least three members in baby language, such as papa, mama, grandpa, grandma, the names of brother, sister, maid servant or others.)
2. Points to parts of body. (Two of four.) Nose; eyes; mouth; ears.
3. Names familiar objects in pictures. (Four of eight.) Dog; cat; horse; cow; dove; electric car; train; automobile.
4. Executes one commission, as "Bring the ball."

Three Years (4 Tests, Credit 3 Months Each)

1. Piles five blocks by imitating the same action of experimenter.
2. Compares the size of two dogs in picture.
3. Repeats two figures.
4. Names familiar objects. (Five of six.) Paper; pencil; chop-sticks; ball; scissors; penny.

Four Years (6 Tests, Credit 2 Months Each)

1. Gives sex.
2. Names familiar objects in pictures. (Five of eight.) The objects are the same as those of the two-years tests, No. 3. However, in this test the name of the objects must be pronounced in adult language.
3. Repeats six syllables. (Two of three.)
4. Compares the length of two lines.
5. The Goddard's form board. (No error; 1 minute.)
6. Draw round the form. (Porteus' four-years test.)

Al. Colors. (Two of four.) Red; yellow; blue; green.

Five Years (6 Tests, Credit 2 Months Each)

1. Counts four pennies or blocks.
2. Copies square.
3. Aesthetic comparison. (No error.) Three paired pictures are modified to the Japanese faces.
4. Comparison of weights. (No error.)
5. Repeats eight syllables. (Two of three.)
6. Finds the way through open paths. (Porteus' six-years test.)

Al. Age.

Six Years (6 Tests, Credit 2 Months Each)

1. Description of pictures. (Three of four.) Four pictures are entirely changed.
2. Definitions by use. (No error.) Table; chair; stove; horse; mother.
3. Makes rectangle with two parts.
4. Copies diamond.
5. Executes three commissions.
6. Indicates omission in pictures. (Five of ten.) The most of the pictures are taken from "The Drawing Completion Tests" of Pintner and Troops.

Al. Finds the way through open paths. (Porteus' 8-years test.)

Seven Years (6 Tests, Credit 2 Months Each)

1. Counts three single *sen* and three double *sen*. (No error.)
2. Right hand and left ear. (No error.)
3. Indicates omission in pictures. (Eight of ten.) The materials are the same as the six-years tests, No. 6.
4. Names four colors. (No error.)
5. Divides the geometrical figures. (Four of ten; 5 minutes.) The figures are adopted from 1 to 10 of Trabue's.

6. Arranges in order four or five series of pictures. (Three of each of six sets; 3 minutes.)

Al. Distinguishes morning and afternoon.

Eight Years (6 Tests, Credit 2 Months Each)

1. Counts from 20 to 0. (20 seconds; one error allowed.)
2. Makes change. "If I were to buy two pencils at 4 *sen* each and should give the storekeeper a 50 *sen* note, how much money would I get back?"
3. Arranges in order four or five series of pictures. (Five of each of six sets, 3 minutes). The pictures are the same as those of the seven-years tests.
4. Names date. (Allow error of one or two days.) Day of month; month; year.
5. Comprehension of the following questions. (No error.) "What's the thing for you to do": (a) "If you are going some place and miss your train?" (b) "If a playmate hits you without meaning to do it?" (c) "When you have broken something which belongs to someone else?"
6. Criticizes absurd pictures. (Easy. Four of six; 1 minute.) Three of the pictures are taken from the Trabue's and the other three are added by the author.

Al. Recognizes the value of thirteen pieces of money. (No error.)

Nine Years (6 Tests, Credit 2 Months Each)

1. Names seasons. (No error; order correct.)
2. Places five weights in order.
3. Gives differences. (One difference in each comparison.) Fly and butterfly; wood and glass; paper and cardboard.
4. Divides the geometrical figures. (Seven of ten.) The figures are the same as those of the nine-years tests, No. 5.
5. Finds opposite words. (Six of twelve; 2 minutes.) (1) early; (2) left; (3) bright; (4) white; (5) up; (6) long; (7) high; (8) sky; (9) hate; (10) rise; (11) day; (12) weak.
6. Comprehension of the following questions. (Three of four.) (a) "What's the thing for you to do when you are on your way to school and notice that you are in danger of being tardy?" (b) "What ought you to do before undertaking something very important?" (c) "What ought you to say when someone asks your opinion about a person you don't know very well?" (d) "Whether should we judge a person by his actions or by his words? Why so?"

Al. Definitions superior to use. (No error.) Table; chair; stove; horse; mother.

Ten Years (6 Tests, Credit 2 Months Each)

1. Disarranged sentences. (No error; 5 minutes.)
   Sample: the sun the west rises from — true false
   (1) twelve months one year make — true false
   (2) floats on water iron — true false
   (3) of wood all are made cups — true false
   (4) noise a cannons make loud — true false
   (5) pens and are used ink for writing — true false
2. Interpretation of pictures. (No error.)
3. Repeats four digits backwards. (Two of three.)
4. Reasoning. (Two of four.)

(a) It is Sunday; and on a Sunday afternoon *Hanako* usually plays with her friends, or takes care of the baby, or reads books alone. Today she has no friends, and does not read books. What do you think she is doing?

(b) How do you think the sky is from the following facts?

(1) When an aviator flys high up in the air, he puts on his coat.

(2) There is ice on the top of Mount Fuji even in the summer.

(c) There are ten pine trees in a row on the sidewalk. If you should plant two cherry trees between each of them, how many cherry trees do you need?

(d) Three boys are sitting in a row. *Taro* is to the left of *Jiro*. *Saburo* is to the left of *Taro*. Which boy is in the middle?

5. Places three words in one or two sentences. (2 minutes.) Boys; river; flower.
6. Ball and field. (Inferior plan; the Stanford revision.)

Al. Criticizes absurd statements. (No error; the Stanford revision.) (a) The road downhill. (b) What the engineer said.

Eleven Years (6 Tests, Credit 2 Months Each)

1. Reading and report. (Eight memories.) Last night about half past nine a fire broke out at *Asakusa*. It took about one hour to put it out, but seventeen houses were burnt down. In saving a girl who was asleep in bed, a fireman was burnt on his limbs.
2. Reasonings. (Three of four.) The tests are the same as the ten-years tests, No. 4.
3. Copies two designs from memory. (One, correct; one, half correct. Expose 10 seconds.)
4. Gives similarities between two things. (No error.) Wood and coal; apple and peach; iron and silver.

5. Divides the geometrical figures. (No error.) The figures are the same as the seven-years tests, No. 5.

6. Analogy. (Four of eight; 2 minutes.) Sample: Ship —captain; school—principal. (1) East—west; south—? (2) Emperor—loyalty; parent—? (3) Elder brother—younger brother; elder sister—? (4) Summer—hot; winter—? (5) Pen—ink; brush—? (6) Village—village headman; city—? (7) Land—train; sea—? (8) Japan—Tokyo; England—?

Al. Ball and field. (Superior plan.)

TWELVE YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Defines three abstract words. (Two of three.) Charity; public benefit; probity.

2. Similarities. (Five of 8.) As materials, four series of figures, from the Form A of the Otis tests, and four series of concrete things, from Meyers' "Mental Measure," are adopted.

3. Fills in the omitted words. (One error or omission allowed; 5 minutes.) If you eat unripe——, or play late at ——, or eat continuously——, you have to be unable to go to—— and—— to a doctor.

4. Interpretation of fables. (Three of four.) (a) "The Fox and the Cow." (b) "Hercules and the Wagoner." (c) "The Farmer and the Stork." (d) "The Miller, His Son and the Donkey." These stories are taken from the Stanford revision tests.

5. Criticizes absurd pictures. (Difficult. Four of six.) One of them is taken from the Trabue's, and one from the Meyers'. The other four pictures are added by the author.

6. Gives more than sixty words in 3 minutes with closed eyes.

Al. Criticizes absurd statements. (No error.) (a) The bicycle rider. (Binet.) (b) The girl who was thought to have killed herself. (Binet.) (c) The railroad accident. (Binet.)

THIRTEEN YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Repeats twenty-six syllables. (Fifteen syllables correct.)

2. Finds opposites. (Five of 10; 2 minutes.)
Sample. Present—to-morrow immediate *past* yesterday late
(1) decay—fall continue flourish destroy produce
(2) lengthen—break shorten vanish decrease extend
(3) help—man work give hinder dislike
(4) love—like angry fear hate friend

(5) obey—officer approve order resist regulate
(6) boast—pessimism modesty anxiety patience timidity
(7) refinement—grace roughness violence eminence nobleness
(8) extravagant—miser economical poverty rich saving
(9) cause—reason effect achievement outset aim
(10) demand—exchange sale profit supply receipt.

3. Repeats six digits. (Two of three.)

4. Places three words in one or two sentences. (2 minutes.) Yokohama; fortune; sea.

5. Clock. (Two of three; the Stanford revision.)

6. Analogies. (Five of ten; 3 minutes.)

Sample. day—bright night—?—shine star *dark* sleep fearful

(1) book—author painting—?—marble model magazine painter man
(2) temple—Buddha ?—God—gate school shrine house charm
(3) electric light—candle automobile—?—wagon electricity speed tire light
(4) Order—confusion ?—war—guns peace powder stone army
(5) ice—water water—?—river cold steam thirst sea
(6) moon—earth earth—?—Mars sun clouds stars world
(7) food—body ?—engine—firemen coal smoke train conductor
(8) sorrow—misfortune joy—?—grief happiness hatred failure pride
(9) village assembly—village ?—city—mayor member city assembly citizen
(10) president—republic emperor—?—kingdom empress territory king empire

Al. Gives similarities in three things. (Two similar points in each series of the things.) Wool, cotton, leather; rose, potato, cherry trees; knife-blade, penny, piece of wire.

Fourteen Years (6 Tests, Credit 2 Months Each)

1. Reasoning. (No error.)

(a) How do you measure exactly 4 *go* of rice with a 3-*go* measure and a 5-*go* measure?

(b) What is inducted from the following facts? (1) When a cannon ball falls into the sea, it does not float. (2) Gold is about twenty times heavier than water. (3) When a copper coin falls into the water, it sinks. (4) Brass is twice heavier than water.

(c) I started from my house and walked 100 *ken;* I turned to the right and walked 50 *ken;* I turned to the right again and walked 100 *ken.* How far am I from my house?

2. Similarities. (Five of ten; 3 minutes.) Find the way in which the first three things on a line are alike. Then look at the five other things on the same line and draw lines under two things that are most like the first three.

Sample. hat shawl glove—hand *collar* head *shoe* house

(1) blue yellow green—sky red sea black flower

(2) plum pear apple—camellia seed peach juice orange

(3) bowl dish tea-cup—chop-sticks cup desk bottle dress

(4) small red good—heavy size color go strong

(5) horse dove firefly—cow wagon leg goat toy

(6) run fly walk—blue sleep long far rise

(7) ship horse train—sail tiger automobile move aeroplane

(8) Japanese socks flag sail—dress ship rod handkerchief table

(9) kindness falsehood abuse—say honesty take theft bad

(10) kindness honesty sympathy—charity selfishness idleness fidelity dishonesty

3. Disarranged sentences. (Six of ten; 3 minutes.)

(1) short an elephant has a nose true false

(2) apples people are many of fond true false

(3) flour of rice bread is of made true false

(4) bananas grow ground the in true false

(5) lead very and things light gold true false

(6) water float and cork on wood true false

(7) is dangerous in the streets dark walk to true false

(8) among good children swimmers are there true false

(9) winter when the comes trees fall leaves all of true false

(10) higher rarer the ascend the we the grow air true false

4. Divides the geometrical figures. (Four of five.) The first figure is added by the author, and the other five figures are taken from Trabue's.

5. Analogies. (Seven of ten; 3 minutes.) These tests are the same as the 13-years tests, No. 6.

6. Criticizes absurd pictures. (No error.) The pictures are the same as the 12-years tests, No. 5.

Al. Finds opposites. (Seven of ten; 2 minutes.) These tests are the same as the 13-years tests, No. 2.

Above tests are arranged from the results having tested about 1200 children in Tokyo, ranging in ages from 2 to 15

years. These tests are selected out of those tests which could be done 70% to 90% by children of that age, almost all by children of one year above that age, and 20% to 40% by children of one year under that age.

The distributions of the I. Q. of children ranging in ages from 6 to 9 years, recently tested by author, are as follows:

I.Q.	Numbers			
	6 yrs.	7 yrs.	8 yrs.	9 yrs.
125-121	1		1	
120-116	1	2	1	2
115-111	6	10	6	3
110-106	14	19	16	19
105-101	27	28	23	25
100- 96	35	33	34	35
95- 91	22	25	25	21
90- 86	12	11	13	15
85- 81	8	5	11	6
80- 76	5	3	2	2
75- 71	2	2	1	2
70- 65	1	1		
Total	134	139	133	130

The correlation of the above tests with teachers' estimation and with the national intelligence tests modified by the author will be reported later.

BOOK NOTES

The Mind in the Making: the Relation of Intelligence to Social Reform. By James Harvey Robinson. New York, Harper and Brothers, 1921. vi+ 235 p.

Perhaps the most conspicuous and significant fact about the study and teaching of history today is the general effort among the younger and more progressive historians to break away from the episodical and anecdotal tendencies and to have less and less confidence in the efficacy and sufficiency of the political narrative. In the place of these older methods and practices there has been substituted an ever growing interest in the history of civilization and in the genesis of the various aspects of human culture. Among these many diverse and promising manifestations of an interest in a more dynamic and consequential type of history, none is more potent for good than the impulse to a consideration of the intellectual history of mankind.

The possible significance of the promotion of intellectual history has been grasped by penetrating thinkers since the opening of the seventeenth century. In his "Advancement of Learning" Francis Bacon stated that: "No man hath propounded to himself the general state of learning to be described and represented from age to age, as many have done the works of nature and the State civil and ecclesiastical; without which the history of the world seemeth to me to be as the statue of Polyphemus with his eye out; that part being wanting which doth most show the spirit and life of the person." Dr. Samuel Johnson in his "Rasselas" held that: "There is no part of history so generally useful as that which relates to the progress of the human mind, the gradual improvement of reason, the successive advances of science, the vicissitudes of learning and ignorance, which are the light and darkness of thinking beings, the extinction and resuscitation of arts, and the revolution of the intellectual world." The development of evolutionary thought in the last century made it plain that the human mind was a product of natural genesis in the same manner as the human body. This fact was made the basis for the notable science of genetic psychology, founded and developed by G. Stanley Hall. Genetic psychology may well be regarded as the indispensable scientific prolegomena to intellectual history. The progress of social psychology from Hume and Comte onward has emphasized the generation and significance of collective and mass thoughts and opinions as an expression of the culture of a given era. This has been appropriated for progressive historiography by Karl Lamprecht and his followers.

While such influences as have been enumerated above have produced the foundation for intellectual history, and while many historians have contributed much important literature to the field, the isolation and demarcation of the province of intellectual history and its organization into a coherent whole have been the achievement of Professor James Harvey Robinson. A prospectus of his conception of the field is to be obtained in his syllabus, "A History of the Western European Mind," gradually developed and elaborated to meet the needs of his classes in intellectual history at Columbia University and the New School for Social Research.

In even the earlier editions of his syllabus, published ten years ago, Professor Robinson promised a comprehensive manual to cover the field of intellectual history. This has long been awaited by his students and disciples, and the present work, delivered originally as the Kennedy Lectures before the New York School of Social Work, is to be regarded as the

first preliminary effort at fulfilling this promise. As an intellectual history of Europe the volume is pathetically inadequate, but as an effort to present the leading generalizations which might be drawn from a long and assiduous cultivation of the field of intellectual history the book is nothing short of a magnificent achievement. Indeed, it is the calm and deliberate judgment of the reviewer that no other book by an historian can be said to equal this one as a presentation of the more significant generalizations of history for the use of thoughtful citizens. From this standpoint Wells's "Outline of History" becomes insignificant and sophomoric by comparison. As a withering attack upon the conventional utilization of history to justify anachronisms in our own civilization the book is both unrivaled and invaluable.

The material in the book is arranged according to the consideration of the following topics: the futility of past efforts at reform because of an ignorance of the mechanisms of the human mind; the chief types of thinking, with special reference to the contrast between secondary rationalization and creative thought; the development of the human mind in its thought content from the animal stage to that manifested in contemporary civilization; the indictment of the capitalistic-nationalistic-pietistic "acquisitive society" of the present day; and an analysis of the bearing of a review of the genesis of the modes of human thought upon the problem of social reform in its widest implications. Throughout the book there is always evident an effort to show the relation of the facts of psychology and history to the present and future of human society. Yet there is no attempt to advocate any special type of reform measure. Indeed, so great is the detachment from propaganda that one eminent reviewer of the book has accused Professor Robinson of playing the rôle of Achilles in his tent.

The significant message of Professor Robinson's volume may be epitomized in the following manner. The basic need of today is to bring our thinking in the field of the social sciences up to the same level of scientific objectivity that now prevails in the realm of the natural sciences. Mankind has experimented unsuccessfully with three methods of reform, namely, tinkering up social machinery, moral uplift, and education through inculcation of "the collective wisdom of the past." We can understand why these have failed only by an investigation of the prevailing modes of thought, their genesis and method of operation. We tend to respect and remain satisfied with the so-called "wisdom of the ages," though every forward step taken by the race has been in defiance of this moss-embellished sagacity. This we do because most of our thinking is derived from a subconscious level, where instinct, habit and tradition dominate. Most of our "basic principles" of conduct are but secondary rationalization of primitive reactions. Our only escape is through the stimulation of creative thought, based upon the experimental and pragmatic method. Yet creative thought is obstructed on every hand by many forces, the variety and potency of which can only be understood after a review of the history of the chief stages in the formation of our present mental content and psychic operations. These stages are those of the genesis of our animal mind, the development of our savage mind, and the formation of our traditional civilized mind. Man's long period of existence as an animal developed in him the variety of instinctive reactions which he possesses, the method of learning by trial and error, and a certain docility and intellectual inertia. The period of human savagery was far longer than that of civilization, and has left its indelible impress upon our modes of thinking. It generated our animistic and mystic tendencies, our strange deference to authority, and our unbelievable conservatism. Most of the basic elements in our religious and ethical beliefs date from this stage of human psychogenesis. Taboos, ideas of "principle," symbolism, notions of the "sacred,"

and dream-logic are some of the more conspicuously powerful vestiges of savage thought which still remain to plague our civilized age.

The background for the emergence of a civilized mind was provided by the Egyptians, who invented writing and many practical arts, by the Babylonians, who excelled in commercial life and in astrology, and by the Hebrews, who developed to an unusually high degree the religious views they had drawn from a primitive era. Working on these and additional data the Greeks first evolved creative thought. "They discovered skepticism in the higher and proper significance of the word, and this was their supreme contribution to human thought." But the Greek intellectual life tended towards metaphysical abstractions and away from experimental and applied science. When the possibilities of metaphysics were exhausted, Greek thought inevitably entered into a period of stagnation and decay. The medieval age brought with it intellectual reversion and deterioration. Christianity, aided by Neo-platonism and the Oriental mystery cults, substituted faith and emotion for reason and critical thought. A definite scheme of creation, life and ultimate destiny was elaborated into a divinely authoritative epic, belief in which was enforced by the powerful Roman Catholic Church. Man was significant only as the possessor of an immortal soul to be saved from eternal torment. The monks and Augustine introduced and established in European intellectual and ethical tradition that impurity complex which, with additional impulses from Protestant Puritanism, has served to prevent any scientific consideration of the problem of sex, right down to our own day. An extensive system of secondary rationalization, supplying an elaborate and sophisticated explanation and justification of these primitive reactions on metaphysical grounds, was provided by the Scholastic philosophy, which culminated in Aquinas. The medieval age added little or nothing of a progressive nature to the thought of the Greeks, but rather revived a vast mass of primitive superstitions which have survived to obstruct the critical and scientific thought of the modern age.

Our modern civilization has been an outgrowth of a totally new type of thinking, which was partially foreseen by Roger Bacon and definitely heralded by Francis Bacon—critical thought and experimental science. This was on all points opposed to the dialectical method of the Greeks and Scholastics, and has proceeded on the notion that "nature is more subtle than any argument." Though opposed by the Church and long by professional scholars, it has triumphed and made possible an entirely new material world through its applications to industry. Yet the great potential benefits of modern applied science have been but very partially and imperfectly realized, owing to the lack of adequate development of moral and social control over the new technique, which is in danger of developing into a Frankenstein monster. The two chief obstacles to a proper socialization of modern applied science are the profit making objective of all modern economic life, and modern nationalistic patriotism, which diverts so much human energy and wealth into processes of mutual destruction. But those in control of modern civilization believe that they stand to gain by the modern theory of business enterprise and by unreasoning patriotism. Hence, they oppose all efforts at reform under a mass of secondary rationalizations known collectively as "the philosophy of safety and sanity." The challenge of the world war to the old social order increased the activity of its guardians, and we have had as a result the Palmer inquisition, the Lusking of New York State, and the "law and order myth" associated with Governor Coolidge of Massachusetts. Yet, if history proves anything it is that excessive repression of progressive tendencies is as ill advised on the part of the vested interests as it is detrimental to society at large. Stupidly thorough repression merely postpones change, makes it violent

and expensive, and costs the vested interests more dearly in the end. Conservatism is partially a savage and primitive trait and partially a sort of collective neurosis through which mechanism the guardians of the existing order seek to avoid facing the social realities of the present day.

Without bravely facing these realities which demonstrate the "sickness of the modern acquisitive society," however, we cannot hope to improve our social order. With the gradual elimination of the belief in the providential nature of social causation and supernatural interference with human institutions, we have come more and more to see that our civilization will be neither better nor worse than we will that it shall be, that man holds his destiny in his own hands. Until the leaders in modern society fully recognize this fact and intelligently accept the responsibility which this carries with it the "race between education and catastrophe" will continue, with the odds wholly favoring catastrophe.

Professor Robinson's book is an eloquent appeal to social initiative, but one feels that it will be read only by a small minority of the population and appreciated only by a small percentage of those who read it. In the meantime the guardians of the modern order and the masses who support them will continue to trust in "the tried wisdom of the ages," the "findings of mankind," "the sturdy virtues of manhood and womanhood," "the sagacity of the Fathers," the "hard sense and practical shrewdness of the modern business man," and "the adroitness and astuteness of the modern politician and diplomat." The outlook is not entirely encouraging or wholly conducive to optimism, and Professor Robinson's book is a convincing demonstration that one can derive little assurance or comfort amidst the novel and diverse problems of the modern age from the perennial conservative rejoinder that somehow things have always come out all right in the past, in spite of the calamity howlers of earlier ages.

HARRY ELMER BARNES, Clark University.

Two New Journals: 1. *Archives of Occupational Therapy.* Edited by Wm. R. Dunton, Jr., M. D., Sheppard and Enoch Pratt Hospital, Towson, Md. Bi-monthly. No. 1, February, 1922, 98 p.; No. 2, April, ending p. 170.

2. *Journal of Personnel Research.* Vol. 1, No. 1, May, 1922. 51 p. Monthly.

The first of these journals is intended to be a circular organ for literature bearing on its subject and represents the American Occupational Therapy Association. The leading article is by Adolp Meyer on the "Philosophy of Occupational Therapy," and other articles are "Training Aides for Mental Patients," "Trend of Occupational Therapy for Tuberculosis," "Recreational Therapy for Heart Disease," "Occupations for the Home-Bound," "Children in Hospitals," "Jewelry Making," "Work of the Tide-Over League," "Psychiatry and Occupations." The type, paper and get-up of the *Archives* are attractive. The type is large, and the lines run across the page. The get-up of the second journal is less attractive, and the type is smaller with two columns on the page. The first number contains three articles: "Reasons for Personnel Research," by J. R. Angell; "The Development of the Personnel Research Federation," by A. D. Flinn; and "Basic Experiments in Vocational Guidance," by C. S. Yoakum. The latter gives most attention to book reviews, notes and abstracts. Both journals somewhat overlap the field of the older *Journal of Applied Psychology*, now in its sixth volume.

Health and Social Progress. Rudolph M. Binder. Prentice, Hall, N. Y., 1920. 295 p.

This admirable work strikes the right note, showing the relation between health, civilization, religion, etc., with sections on health in Ancient Greece,

Rome and the tropics, its bearings on world progress, originality, etc. Civilization is the product of healthy people, and most leaders have had exceptional vitality. Genius consists in making syntheses or, in Kant's phraseology, organizing the maniform under some unifying principle. Health is not necessarily identical with athletics. It may involve ability to resist small and constant ailments, which is a better measure of health and vitality. Success involves constant effort along a particular line with strain on a particular organ and so is apt to be more detrimental than general physical labor. The general neglect of the commonest rules of health by workers makes a sad chapter. The author illustrates his thesis, which maintains that ability, vitality and even longevity go along together, by many individual examples. Genius is ourselves raised to a higher power. Very many people have assumed that society must be transformed rapidly and completely, but it is a colossal task. The traits of genius are that it strives for the *accessible*, knowing the capacities and limitations of human nature. Hence, it is adaptable. Another of its traits is *objectivity*, and yet another is youth. The objective genius requires a certain degree of maturity as the subjective or verther type does not. But as life grows complex, it becomes necessary to create by reassembling in one organism the scattered members.

Men and cattle will be adapted to lower latitudes. Telic civilization is taking the place of genetic development. Gorgas said civilization is drifting back to the tropics. Genius gives the world the vital ideas which make civilization possible. It is within our powers to turn our whole social destiny back to the paths of health, and, in the new era just ahead, health will be considered of prime importance.

Universities and Scientific Life in the United States. By MAURICE CAULLERY. Harvard University Press, Cambridge, 1922. 269 p.

The author was exchange professor at Harvard during the war and in 1916 spent five months in travel and study to prepare this book. It was addressed mainly to France, and the many suggestions to reform make it seem often a little critical of her institutions. Most of its data are familiar enough to American educators, but the comprehensiveness of its survey and the admirable perspective which it affords make it the best general picture of higher education in this country which we have today. The author is a biologist and treats this subject more fully than any other, as might be expected. He has great sympathy with research and describes the American university as like Milton's "tawny lion pawing to get free" from the older college from which it sprung. He includes, also, general views of the relations between the faculty and the president, a theme which perhaps reached its highest point of interest when he was here. He is an ardent advocate of academic freedom, of the autonomy of faculties and even departments. His book, of course, does not include any account of the upheavals and transformations of American universities due to the war. Indeed the history of these last few years could hardly be written yet, because we are in the midst of changes probably far more revolutionary than we now realize and the view of which cannot yet be forecast. The author is especially interested in the new rapport between the academic institutions of this country and of France and would be glad to see American graduates flock to his country as they formerly did to Germany. But the implications as to the relative state of academic work in the two countries will hardly be to favor graduate study in France.

The Psychology of The Other One. By MAX F. MEYER. Missouri Book Co. 439 p.

A Brief Manual of Psychology Demonstrations. By MAX F. MEYER. 108 p.

These little hand-books show how for some twenty years the author has

taught psychology to freshmen. His methods of approach are perhaps most original and challenging to current methods that we have had in this country since psychology became a science and should be carefully considered by all instructors throughout the land who face the problem of teaching beginners. His standpoint is characteristic in the sense that the author does not believe in soul as an independent entity, but stresses physiological functions. It is almost the reverse of introspective in that the author does not make consciousness the supreme oracle, but gives a large recognition to the unconscious, without being in any sense Freudian. "The Other One" is partly the submerged part of the soul, but is to be studied objectively in the other member of the pair with whom each student is associated. Thus we are told: How the Other One becomes an object of interest to us; How it manifests active reactions; How it appears now attentive and inattentive; Learns; Wills; Evolves from anatomical functions; Reflexes its dormal activity, space perception, reaction to spectum and signals; Talking machinery; Rhythm; How the Other One acts if born blind or deaf or walks in sleep; with a final chapter on mysteries of the soul, like hypnotism, religion and politics.

This work is deserving of a far fuller notice as a pedagogical novelty in the field than this journal can give it.

Sex Searchlights and Sane Sex Ethics: An Anthology of Sex Knowledge. By Dr. Lee Alexander Stone. ($7.00.) Science Publishing Co. 1922. 779 p.

This is a very comprehensive work treating of Reproductive Function and its Organs; Physiology and Psychology of the Reproductive Organs, Puberty, Continence, Masturbation, Impotence and Sterility, Sex-Eugenics-Heredity, How to Love, Marriage, Birth Control, The Limitation of Offspring by the Prevention of Conception, Sex Facts for the Male, Advice to Girls Approaching the Threshold of Womanhood, Sex Facts for the Married, Menopause, Pregnancy, Abortion, Syphilis and other diseases, Prostitution and Segregation, Quacks and their methods, Modesty and Prudery, Sex Education at Home and in School, Sexual Hygiene, If Every Man Were Straight, Are Children Getting a Square Deal, Sex Searchlights, Sex Tragedies, Selected Poems, Glossary and Bibliography.

There are several score of illustrations, including photographs of epoch-makers, of normal and abnormal organs, and what seems in shocking taste—a number of cartoons with an evident and earnest moral purpose, but which to our mind give the book an almost vulgar aspect to those who thumb it through for the first time. The author avoids everything pantographic and shows himself not only a man of science, but a reformer. It is high time we had a book of this sort, but we wonder whether the author has not attempted the impossible, viz., to appeal at the same time to experts who want authorities and to the public which needs incitation to virtue and to be warned against vice. We wish the author had come to terms more closely with the Freudians. Some of his twenty-nine chapters might have been written in a pre-Freudian age.

La Technique Educative. By Jean Devolve. Paris. 319 p.

The author here attempts a kind of pedagogic organon and discusses both intellectual and moral pedagogy, the technique, demonstration and social factors of moral education. He lays stress upon the questionnaire as a guide for observing moral character of children in school and discusses the pedagogic idea of attention. In the second part he discusses the pedagogic movement in literature, the auxiliary sciences and goals of education, and in the third part he treats upon the application of these principles to teaching in France, discussing moral training of public schools and uni-

versities of that country, with special attention to recent literature on the subject, finding that these problems have taken a new aspect since the war.

The Transactions of the Institute for Child Study. Edited by YOSHIHIDE KUBO, Ph. D. Tokyo, 1922. 316 p.

This stately volume in Japanese contains articles on: Revised and Enlarged Methods of Measuring the Mental Ability of Children; Lung Capacity of the Students of Various Girl Schools; Mental and Physical Development on entering School; Temperature of the Body, Pulse and Respiration of Kindergarten Children; Development of language of pre-School age children; Mental Tests for Kindergarten Children; Arithmetical Ability of Children; Distribution of Intelligence of the First Grade Children; with an Abstract of Foreign Publication on Child Study.

The many cuts and tables suggest various new devices.

The Dalton Laboratory Plan. By EVELYN DEWEY. Dutton Co., N. Y., 1922. 173 p.

The plan itself is first described, then the laboratory, the assignments, the Dalton high school, opinions of teachers and pupils, the children's university school, and the need for an improved education. This plan, developed by Miss Helen Parkhurst, makes the children the experimenters and the instructors observers who should be ready to serve the community as their special talents are needed. They study children to find the environment to best meet their needs. The mind is not jerked from one subject to another arbitrarily, for this interrupts the natural and ordinary mental processes imposed by the organization of the program. A secondary school used this plan in England as a unit of 110 pupils per teacher, and Miss Parkhurst believes that the teacher can meet 200 pupils as well. The change of teachers, too, is minimized. The school year is ten months, and there is no time schedule or bell to summon from one room to another. Thus the children enjoy a larger world, and the laboratory approximates life in the community, giving great range to individual differences and breaking up lockstep.

The Elementary School Curriculum. By FRED. GORDON BONSER. Macmillan Co., N. Y., 1922. 466 p.

The first eight chapters develop principles relating to life activities and children's needs, while the second part applies these to constructive curricula in different subjects, Geometry, Arithmetic, English, Music, etc. The work gives due recognition to the project plan, is social and pragmatic. The book is far less revolutionary than its preface induces us to expect.

Science and Common Sense in Working with Men. By WALTER D. SCOTT, N. H. S. Hayes. Ronald Press Co., N. Y., 1921. 154 p.

The authors claim a new point of view in dealing with men in industry. They should no longer be regarded as so many kilograms of energy nor from the paternalistic standpoint, but as individuals to be tested, mental and physical and theoretical ability, and who should have their characteristic qualities rated, their history taken into account, as well as their instincts. We must remember that opportunities are changing and that adjustment is a continuous process.

The Johns Hopkins University Studies in Education, No. 4: The Effect of the Physical Make-up of a Book upon Children's Selection. By FLORENCE E. BAMBERGER. Johns Hopkins Press, Baltimore, 1922. 162 p.

The experiments here, mostly in Teachers College, were also chiefly on children of the first to the third grade. They actually picked out different

editions of the same book and then gave the reasons for their choosing. The conclusions are brought out with needless methodic pedantry and elaboration with curves and tables galore. The conclusions, however, and the methods should have been found more concisely set forth. These conclusions are that the make-up of a book influences selection, so do the cover, the title, and that the externals of a book may be negative in their influence, etc.

A Socio-Psychological Study of Fifty-three Supernormal Children. By WILLIAM T. ROOT, Jr. Monographs, Psychological Review Company, N. J., 1922. 134 p.

This is a study of fifty-three supernormal children, all with one exception between the ages of seven and sixteen, all Caucasian and speaking English fluently. This study is of unique interest, not only because of its subject, but because in its thirteen pages of "Conclusions" the author gives somewhat free scope to inferences which, although somewhat speculative, are at the same time highly practicable. He recognizes, too, the limitations of this method and, better yet, the vast number of factors included and the very wide range of individual variations. It would seem as though this author, unlike many of the "testers" and despite his complicated technique and elaborate and, to our thinking, for the part not very valuable tables, was nearer than most to the recognition that the next step in this whole movement should be the very minute and painstaking study of single cases. With the exception of one excellent report of this kind by Terman, the writer of this note knows of no exhaustive analysis of a single case such as the few that have characterized and perhaps constituted the most important part of the Freudian literature, e. g., the Irma, Dora and other cases. Something like this is surely next in order.

The Psychology of Arithmetic. By E. L. THORNDIKE. N. Y., Macmillan, 1922. 314 p.

Psychology has lately shed much light on the process of learning, and it has itself learned to measure the amount, rate and conditions of improvement, while we have obtained better understanding of the so-called higher processes of analysis, abstraction, the formation of general notions and of reasoning. This book presents the application of the newer dynamic psychology in the field of arithmetic. In fifteen chapters, with selected bibliographies, the subject matter is presented in very great detail with many diagrams and tables and the characteristic stress laid upon methodology. Whether the author has brought the intricate subject matter within the range of a teacher of arithmetic and whether it will ever much affect presentation will be doubted, but it is at any rate a very interesting contribution to psychology.

What Is Social Case Work: An Introductory Description. By MARY E. RICHMOND. N. Y., 1922. 268 p.

In this excellent little book, the author describes not only the work but the spirit of the "straighteners," and gives the general principles of case work. This ranges all the way from insightful suggestions and social readjustments to a complete change of environment. The end always is improvement of social relations and the development of personalities. Officialism is to be avoided. Joint programs are often useful. Human beings are interdependent, and the work begins in the family or home and has its own corps of experts, but must be given as wide correlations as possible.

The Cure of Imperfect Sight by Treatment without Glasses. By W. H. Bates. 1922. 313 p.

This opthamologist polemizes against glasses. He would give the eyes occasional rest by pressing and slightly massaging the eye balls with the palms of both hands to give absolute darkness, which closing the lids does not give; also by periods of very acute fixation; third, by recalling vivid optical memories; and fourth, by developing "eye-mindedness" by intensive use of the visual imagination.

L'Evolution Psychologique; et la Littérature en Angleterre. Louis Cazamian. Paris, 1920. 268 p.

The author gives a very interesting sketch of what might be called belletristic literature in England from the time of Elizabeth to the present, with special chapters on "Literature of the Restoration," "Classicism," "The Moral and Social Aspects of Romanticism," "The Transition to the Neo-Classic and Neo-Romantic Age," showing in a general way how English literature has been progressively affected by psychologic and philosophic thought, the two not being very clearly distinguished. Very interesting is his verdict concerning Samuel Butler, George Eliot, William Morris, the Brownings, Rossetti and Swinburne, to each of whom he gives considerable space. He does not come down to the living present, and we look in vain for his verdict concerning contemporary authors.

How To Measure in Education. By William A. McCall. N. Y., Macmillan, 1922. 416 p.

The author treats how to use measurements, how to construct and standardize tests; tabular, graphic and statistical methods; and under these three divisions has seventeen chapters, 48 tables and 25 diagrams. He tells us that the science of measurements is in its infancy, while as an art it is younger still; that measurements of children have come to be the most dramatic tendency in modern education. In fact, the study has become one of the distinctive features of American education. The demands have been so great that the effort to meet them has resulted in almost feverish effort. The author attempts (1) to present the successes and warn against mistakes; (2) to help on the movement of making teaching a genuine profession; (3) to meet the needs of educators interested in both the how and the why, and finally to bring together most of the techniques needed by those who engage in this work. It is both autobiography and biography, the first because he spent so much time in Teachers College, which is the best laboratory for this kind of work, and biographic because he sees the tangible evidence of his many teachers, viz., his pupils, to whom he makes due acknowledgments.

The Introduction to the Study of Language. By Leonard Bloomfield. Henry Holt & Co., New York. 335 p.

The author is associate of Philology at the University of Illinois. There is no indication as to when the book appeared. It has just come to our hands, but the references to literature are certainly not up to the present date. The author avowedly follows Vunt in his psychology. His treatment of child langauge is most superficial, and he has no adequate conceptions of the contributions to his subject in this field. He is strong on the physical and phonic bases of language or its morphology.

Peace and Bread in Time of War. By Jane Addams. The Macmillan Co., N. Y., 1922. 257 p.

Miss Addams here gives a very frank and more or less autobiographical account of a small group of women who before and during the war tried to

develop the influence of the Women's International League for Peace and Freedom. She tells the story of the Ford ship, Wilson's policies, bread rations, women's traditions, speculates on bread, liberty and war slogans; gives her personal reactions in time of war; its aftermath; her experiences in Europe during the armistice and after two years of peace. It is the hunger and starvation caused by the war that appealed most strongly to her.

Intelligenz und Begabungsprufungen. By DR. J. SUTER, Privatdozent in Zurich. 174 p.

This volume treats of the present status of tests for ability; the method of psychological experiment; tests of thought, fancy and memory; methods of testing accuracy of vision, of tactile discrimination, shortness and rapidity of movement; vocational tests with bibliography.

Handbuch Psychologischer Hilfsmittel der Psychiatrischen Diagnostik. By Otto Lipmann. 1922. 296 p.

There are seventy-two topics here treated, such as: Counting, Arithmetical Tests, Reading, also with inverted page and from right to left, Writing, Drawing, Recognition, Imitation, Natural Intelligence, Rapidity, Accuracy, Instruction, Permutation, Filling of Gaps, Making Abstract into Concrete, Opposites, Subordinate Ideas, Parts and Wholes, Vocabularies, Situations, Curve of Work, Einstellung, Series of Rhythm, etc.

Ten Little Lessons on Vitamines. By Eugene Christian. Westfield, Mass., Vitamine Research Association.

These are on the Background, History, a Step Nearer the Mystery of Life, Deficiency Disease, Infancy, Relation to Children's Health and Growth, Health of Men and Women, How to Preserve the Vitamine Content of Foods and Healthy Teeth.

Modern Educational Series. Compiled by R. D. PATEL, Rajkumar College, Rajkot. 1921.

These eight pamphlets, *circa* 100 pages each, are respectively on Art and Industrial Training, Moral Instruction and How to Impart It, Popular Education and National Prosperity, First Steps in Evolution, Intellectual Culture or The Pleasures of Science, Claims of Science in National Life.

Die Grundlagen der Psychischen Entwicklung Eine Einführung in die Kinderpsychologie. By K. KOFFKA, 1921. 278 p.

After discussing problems and methods, subsequent chapters are devoted to general viewpoints and facts of development, to point of departure, special tendencies of psychic development, problem of memory in child in outer world.

Studies in Infant Psychology. By JOHN B. AND ROSALIE RAYNER WATSON. *The Scientific Monthly*, Dec., 1921.

This valuable contribution, made on new-born infants in the lying-in hospitals, considers grasping, reaching, right and left handedness, early eye movements, the Babinski reflex, sitting alone, with notes on experimental study on emotional life—fear, rage and love. Tests are carried on to the age of nearly one year.